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American Railroad Journal.

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Saturday, April 5, 1851.

Hempfield Railroad:

The following is a synopsis of the act which recently passed the Legislature of Virginia, granting the right of way to the Hempfield railroad company.

Sec. 1, authorises the opening of books in Wellsburg, and Bethany, Va., for the purpose of receiving subscriptions to the amount of two hundred thousand dollars, divided into shares of one hundred dollars each to construct a joint capital stock for the purpose of constructing a railroad from the town of Bethany, in said county, to such point on the Pennsylvania State line as the president and directors of the company hereinafter incorporated may select.

Sec. 2. Whenever 400 shares have been subscribed, the company shall be considered as incorporated by law.

Sec. 3. In case any railroad shall hereafter intersect the railroad by this act authorised to be constructed, the company of the said Wellsburg and Bethany railroad shall carry the passengers and tonnage from the point of intersection to either *terminus* of the said road at the rates per mile that they charged for the through passengers and tonnage.

Sec. 4, authorises the town of Wellsburg to subscribe for 500 shares of the stock, and the branch of the N. W. Bank at Wellsburg, 400 shares.

Sec. 5, provides for the town of Wellsburg issuing scrip, bearing 5 per cent. interest.

Sec. 6, authorises the Hempfield railroad company to extend their railroad from a point on the western boundary of Donegal township, in Washington county, Pa., though the territory of Virginia, to the city of Wheeling; provided they shall commence within three years, and complete the same within six years from the passage of this act.

Sec. 7. If the said Hempfield railroad be not constructed by way of Wellsburg, in the said county of Brooke, the said Hempfield railroad company shall, on pain of forfeiting the privileges granted to them in this act, construct a branch of their railroad to some convenient point on Buffalo creek; at which the Wellsburg and Bethany railroad may connect with the same, and said branch shall be completed as soon as the said Wellsburg and Bethany railroad shall be completed from Wellsburg to the said point of connection.

Sec. 8. The said Wellsburg and Bethany railroad shall not, nor shall any branch thereof, be constructed to any place further eastward than Bethany, except on a proper route to make the said connection with said branch of the Hempfield railroad, and for that purpose only; and the said Wellsburg and Bethany railroad shall not connect with, nor transport freight or passengers to or from any railroad, which may be constructed in the State of Pennsylvania, except the said Hempfield railroad. But the foregoing provisions of this section shall cease to have effect if the said Hempfield railroad be not commenced within two years and completed within six years from the time of passing this act.

Sec. 9. If the said Hempfield railroad company accept the privileges herein granted, they shall make no greater charges for the transportation of freight or passengers on their road, to or from the said Wellsburg and Bethany railroad, than on freight or passengers carried to or from that part of the Hempfield railroad in this State for like distances and under like circumstance.

Sec. 10. Neither the said Hempfield railroad company nor the said Wellsburg and Bethany railroad company shall construct any part or branch of their railroad northward of Wellsburg aforesaid.

There is now no obstacle to the construction of this road, but money; and this we cannot believe will be long wanting. It cannot be that the friends of the Pennsylvania Central railroad will suffer the above project to flag; one that is so important to the interests of the Central road, and to Philadelphia.

The directors of the Hempfield company held a meeting at Washington, Pa., on the 18th ult., at which it was resolved to proceed at once to the work of construction, as soon as the necessary surveys can be completed. This meeting was adjourned to meet at Wheeling on the first Wednesney of May next, for the purpose of conferring with the directors of the Ohio Central road, which is the virtual extension of the Hempfield road west.

For the American Railroad Journal.

H. V. POOR, ESQ.,

The following article from the Cincinnati Gazette, and from the pen of one of the most intelligent and scientific gentlemen of the west, exhibits very fairly the resources and prospects of the mineral region of Ohio.

The mineral resources of that portion of the State are coal, iron and salt. These minerals underlie a rich soil, productive in all the cereal grains, and in every fruit for which men tax mother Earth within that climate. The German emigrants in that country are making extensive plantations of the grape in that region, and very intelligent men are looking forward to the time when the Ohio will be as celebrated for its wines as the Rhine.

Yours truly, I. DILLE.

New York, March 31, 1851.

CENSUS STATISTICS OF THE OHIO MINERAL REGION. ITS GROWTH AND TOWNS.

Our *fourth* section view of Ohio includes what is called the Mineral Region. We must premise that this does not mean the *whole* mineral region of Ohio, by any means. On the contrary, that runs in a broad belt from the Ohio river to Lake Erie; and is everywhere full of mineral productions of the richest quality. We can give a brief view of it in a few words, as preliminary to the particular section we are about to describe.

The COAL FIELD of Ohio underlies the surface of about 28 counties, extending from a little east of Portsmouth to the Ohio east, and Lake Erie north, and is supposed to embrace at least 12,000 square miles. A comparison of this field with some of those in Europe, will but illustrate its magnitude and value.

Coal field of Ohio	12,000	square miles.
" Great Britain	11,850	"
" France	1,719	"
" Belgium	518	"

England has in fact not more than *one-fourth the*

workable coal field of Ohio! Ohio has about *one-tenth* of the workable coal fields of the now United States. She has coal enough to supply all the fires and machinery of the United States and Great Britain through countless ages to come. The question of amount, therefore, is of no consequence, when we have amount enough to supply the world.

The IRON FIELD is much narrower, but still one of great magnitude. It extends from the Ohio river to Lake Erie, and from Brush Creek, in the county of Adams, to the counties of Meigs and Muskingum, and is found in various forms—from the varieties of lime ores to the bog ores found chiefly near the lake. The *workable* strata, however, is much narrower, and with the exception of some works in Licking, Lake, etc., is chiefly confined to the counties of Scioto, Lawrence, Jackson and Hocking.

The SALIFEROUS REGION adjoins the Iron Field east, and is also very extensive. Salt water has, indeed, been found in many parts of Ohio, but the locality in which the water is strong enough to be profitable, is comparatively small. In the early settlement of the State, salt water was found in Trumbull county, by Gen. Parsons, but the salt-making is confined chiefly to Muskingum, Morgan, Athens, and Meigs counties.

The Mineral Region, as it is generally termed, referring to that which *unites* all the minerals of Ohio, and is chiefly valuable for that species of resources, consists of the Hocking valley and the lower part of the Muskingum valley, and so we shall consider it. We shall include the county of Monroe in this section, both, because it is watered by the branches of the Little Muskingum and because it contains both iron and coal.

Below are the counties, population and growth of this section. It has been said, in reference to our article on the "Scioto Valley," that *Jackson* county belonged to that valley. So it does, in one sense—but it belongs to the "Mineral Region" more. The county of Adams, on the other hand, belongs more to the Scioto than to any other district, and the exchange was, therefore, sufficiently correct and more convenient to our purpose.

	1840.	1850.	Rate in increase.
*Athens	19,109	18,218	Decrease.
*Fairfield	31,924	30,221	Decrease.
*Gallia	13,444	17,066	27 per cent.
*Hocking	7,741	15,875	62 "
Jackson	9,744	12,825	32 "
Lawrence	9,738	15,392	60 "
Meigs	11,452	17,988	56 "
Monroe	18,521	28,378	53 "
Morgan	20,852	28,326	36 "
Muskingum	38,749	45,043	16 "
Perry	19,344	20,744	8 "
Vinton	New county.	9,353	
Washington	20,694	29,770	48 "
	223,312	289,199	31 "

* Athens lost six of its original townships in the change of counties: three to the new county of Vinton, two to Morgan and one to Fairfield.—Jackson lost three townships to make the county of Vinton. Fairfield lost two townships to Hocking, to make up for two of Hocking put into Vinton. In the aggregate, however, the original territory of this district is the same. We thus see, that while this district has had no commercial advantages whatever, and no large towns, which has added so much to the growth of other districts, its increase is, notwithstanding, equal to the general increase of the State. But, if we take out the great agricultural counties of Fairfield, Perry and Muskingum, whose mineral resources are comparatively undeveloped, we shall find that the residue of the district has increased 45 per cent., more than any other section of the State! And, we find further, that the counties of Lawrence, Meigs, Jackson and Hocking have increased 50 per cent., and these are the counties in which the largest part of Ohio iron and coal is got out. The east end of Scioto county for iron, and the county of Morgan for salt, should be added.

As a consequence of these facts, the question naturally arises, if, without large towns, without railroads, and almost without commerce, this region has grown so rapidly, what will it be when capital, commerce and railroads come to it? We hazard nothing in saying that it will be the great workshop of raw materials for the Ohio valley.—There is the greatest abundance of coal and iron and salt in other places, but where is one which will compare with it for convenience and cheapness to CINCINNATI?

Let us now look to its comparative growth:

		Increase.
Mineral Region in 1820	90,524	
" " 1830	141,441	55 per cent.
" " 1840	223,312	58 "
" " 1850	289,199	31 "

The growth of this section has been very nearly parallel with the average growth of the State, and when we consider that it has neither had the large towns—nor the commercial advantages—nor the superior lands of the other parts of the State, this fact speaks much in regard to its future development.

The mineral region contains (as we have bounded it) about 6000 square miles—a little less than the Scioto valley—and about equal to the Western Reserve. Its *density* of population is 48 to the square mile. Its towns are not large, though their growth has, in the last decennial period been very rapid.

	1830.	1840.	1850.
*Zanesville	3,094	6,192	10,335
Lancaster	1,800	2,120	3,483
*Marietta	1,550	2,506	4,142
McConnellsville	375	957	1,660
Gallipolis	755	1,221	1,686
Athens	600	710	898
Somerset	600	1,006	1,240
Logan	97	560	798
*Pomeroy	....	400	3,400
Ironton	....	....	570
Total	8,871	15,606	28,802

* In Zanesville is included Putnam, connected with it by a bridge. In Marietta we have included Harmer, connected with it in the same way, and in Pomeroy is included Coalport, and the series of villages which taken together, make up the town. Of these towns, some three or four are destined to be large manufacturing places.

The mineral region is more variegated by hills, and less alluvial in soil, than any other part. It is the only part, we believe, which contains any considerable portion of pine trees and evergreen plants. TAR has for many years been made in Jackson county, and sold in Chillicothe, and a large part of that district yet contains pine stumps. SALT has recently been made in some new localities, where the water promises to be very strong. This is specially the case in Pomeroy. Opposite that town, in Virginia, (of course in the same geological formation) we are told that a very large salt furnace has been erected, from which some samples of salt have already reached this city. Our space forbids our further description of this interesting section; but we may add that the mineral hills of Ohio are among the very healthiest localities in the Ohio valley, where the breezes of summer refresh and strengthen, and fevers seldom appear.

American and Foreign Building Stones.

Comparison of Experiments on American and Foreign Building Stones, to determine their relative Strength and Durability. by Professor Walter R. Johnston, of Washington, D. C.

Continued from page 195.

1. *Trials of two-inch cubes of the coarse-grained "alum limestone," used at the National Washington Monument, to ascertain its resistance to crushing. By Dr. Charles G. Page.*—The specimens were stated to have been furnished by the owners of the quarries, and the testing to have been performed by the aid of a "powerful hydraulic press," so arranged as to "indicate accurately the amount of pressure." Not having witnessed any of the experiments or the arrangements of the machine, the writer feels bound to say that these allegations respecting the machine have been published by the architect, by the superintendent, and by others concerned in building the monument at Washington. The experiments were communicated to the writer by Dr. Page.

No. of the trial.	Crushing weight in pounds per square inch.
1.	910
2.	1372
3.	2281
4.	2312
5.	2437
6.	2531
7.	2625
8.	2650
9.	2750
10.	2843
11.	2968
Average strength	2334

Note.—From the above it appears that the greatest strength per square inch, when tested in two inch cubes is 2968 pounds, and the least 910 pounds, the latter being about 30 per cent. of the former number.

2. *Trials by Dr. Page of the other building materials* to obtain results, on two-inch cubes, comparable with those afforded by the "alum limestone."

No. of trial.	Kind of stone.	Crushing weight in lbs. per square inch.
1.	Fine-grained marble of Symington	4562
2.	Another sample of do	4400
3.	White veined marble, East Chester, N.Y., used at the General Post Office	4081
4.	Do. another specimen	3906
5.	Italian marble	3156
6.	Patapsco granite	2941
7.	Do. another specimen	2593
8.	Seneca sandstone, (Smithsonian building,)	2691
9.	Do. do. another specimen	2691
10.	Stockbridge marble, Mass.,	2410
11.	*Alum Limestone* (*casing of monument*), average as above	2334
12.	Stockbridge marble 2d specimen	2093
13.	York road freestone, (a friable brown sandstone)	2125
14.	Aquia Creek sandstone, (Patent Office)	2093
15.	Do. do. do. 2nd specimen	1875.
16.	Do. do. do. 3rd do.	1441
17.	Do. do. do. 4th do.	1234
18.	Common building brick	1000

Arranging in order of the average strength, we have the following succession, a column of relative values being added in which the alum limestone is reprosented by 100.

	Average strength per square inch.	Relative value
1. Maryland fine-grained marble	4481	192
2. East Chester (N.Y.) marble	3993	171
3. Italian marble	3156	135
4. Patapsco granite	2767	118
5. Seneca (Smithsonian) stone	2691	115
[6. *Alum limestone* (monument)	2334	100]
7. Stockbridge marble	2251	96

8. York road freestone	2125	91
9. Aquia Creek (Patent Office) sandstone	1660	71
10. Common brick	1000	42

Note.—The two sandstones, numbers 5 and 8, have a mean strength of 2408, which is three per cent. higher than that of the "alum limestone," which has its place between them in the above series. The four trials of the Aquia Creek sandstone give an average strength of 1660 pounds, and the first three experiments of Dr. Page on the alum limestone gave an average of 1521 pounds, showing the inferiority of at least some portions of this limestone to that "material which now disfigures the architecture of the Treasury building and the Patent Office."*

3. *Experiments on different building materials, published by Mr. Robert Mills*, architect of the Washington National Monument. Specimens of the same size as the preceding.

No. of trial. Kind of stone.	Strength per square inch.	Relative value.
1. Symington's fine-grained marble	6344	271
2. Baltimore granite, Sumwalt and Grayson's	6250	267
3. Blue rock from Potomac, used as the backing Stone of the National Monument	3750	160
4. Granite of the east, *Port Depocit*	3250	139
5. Granite of Normandy,†	2628	112
[6. *Alum limestone*, monument	2334	100]

4. *Marbles and limestones tested and reported on by Mr. Rennie in England.*‡

No. of trial. Kind of stone.	Lbs. per sq. inch.	Relative value
1. White Italian veined marble, (tried in 1½ inch cubes)	9681	414
2. Black Brabant marble, tried in 1½ inch cubes	9281	395
3. Purbeck stone, ditto	9160	392
4. Black compact limestone, Limerick, Ireland, tried in 1½ in. cubes	8855	379
5. Compact limestone, do	7713	330
6. Devonshire red marble do	7187	308
7. White statuary marble not veined, ditto	6058	259
8. White Italian veined marble, tried in one inch cubes	3216	137
[9. *Alum limestone* (as above)	2334	100]

Note.—From his own reading of the original memoir of Mr. Rennie, the writer was led to suppose that all the above samples of stone numbered from 1 to 6 inclusive, had been tested in two inch cubes, and that the Numbers in the philosophical transacactions (1848) referred to blocks of four square inches on the base; but in the Encyclopedia Britannica Mr. Tredgold has given the dimensions 2.25 square inches for the base. Barlow has apparently understood Mr. Rennie in the same way. On this latter area the above numbers are computed. On the supposition of a four inch base they would stand as follows :—

No. 1 gave per square inch	5445	lbs.
" 2 " "	5185	"
" 3 " "	5152	"
" 4 " "	4981	"
" 5 " "	4338	"
" 6 " "	4178	"

These numbers change the relative values but they do not alter the position of the "alum limestone," which stands, as proved by Dr. Page, far below all the limestones and marbles, tested by Mr. Rennie, whether the latter were in 1, 1½ or 2 inch cubes.

5. *Experiments by Mr. Rennie on granites, tested in 1½ inch cubes.*

	Lbs. per sq. inch.	Relative value
1. Aberdeen blue granite	10,913	467
2. Peterhead hard close-grained granite	8,282	354
3. Cornish granite	6,356	272
[4. *Alum limestone*, as above	2,334	100]

* Hints on Public Architecture, p. 114.

† See below some accounts of other granites of Normandy, tried in two-inch cubes by Rondelet.

‡ Transactions Royal Society, 1818.

6. *Mr. Rennie's experiments on sandstones.*

	Lbs. per sq. inch.	Relative value.
1. Very hard freestone, 1½ in. cubes	9446	404
2. Dundee sandstone, breccia, do.	6630	284
3. Bramley falls sandstone, near Leeds, do	6063	259
4. Craigleith white freestone, do	5487	234
5. Portland Stone, do	4570	195
6. Killaly white freestone, do	4561	195
7. Derby grit red friable sandstone, average of two varieties, do	3743	160
8. Portland stone in a 2 inch cube	3729	159
[9. *Alum limestone of Maryland*, as	2334	100]

Note.—The weakest of the above sandstones is 27 per cent. stronger than the strongest specimen of the alum limestone tried by Dr. Page.

7. *Experiments by Messrs. Daniel and Wheatslone*, on the magnesian limestone of Yorkshire, Derbyshire and Nottinghamshire in England, employed in building the new houses of Parliament.* Tested in two inch cubes in duplicate.

	Lbs. per sq. inch.	Relative value.
1. Stone of Kiveton	10,695	458
2. " Stone-ends	9,209	394
3. " Bolsover Moor	8,288	355
4. " Kiveton, 2d variety	6,163	284
5. " Norfall	5,879	252
6. " Steetley, yellow variety	5,171	221
7. " Steetley, white do	3,192	136
[8. *Alum limestone of Maryland*, as before	2,334	100]

Note—The average strength of the seven varieties of stone above compared is exactly three times as great as that of the "alum limestone."

The stone used for the houses of Parliament is described as standing, in its natural site, high above the ground, in large masses or perpendicular walls, with its smooth, bleached, time-worn surtace, discolored only by a few lichens with a little moss or ivy—facts clearly indicating its strength and durability.

8. *Experiments on Marbles made in France by Rondelet, Gauthey, Sufflot and Perronet*,† on two inch cubes, the weights and measures being reduced to English to conform to the other series.

	Lbs. per sq. inch.	Relative value
1. Black marble of Flanders	11,218	480
2. Cerveles marble of Flanders	5,738	245
3. White Statuary marble	4,652	199
4. Blue Turquin marble	4,328	185
5. Veined white marble	4,241	181
6. Veined white marble called Pauf	3704	158
[7. *Alum limestone of Md., as above*	2,334	100]

Note.—With the exception of the first of the above trials the French experiments conform pretty nearly with those of Mr. Rennie on similar materials supposing the numbers given by the latter were obtained from two inch cubes; but they fall far below his results, admitting, with Tredgold, that his blocks were 1½ inch cubes. Gregory appears to have understood that all Rennie's experiments were made on 1½ inch cubes unless otherwise expressly stated.

9. *Experiments of Rondelet and other French experimenters on two inch cubes of granite.*

	Lbs. per sq. inch.	Relative value
1. Oriental rose granite	12,518	536
2. Granite of Normandy called *Champ du Bout*	11,628	498
3. Granite of Normandy called *Gallicien*	9,987	428
4. Granite of Bretagne	9,303	398
5. Green granite of Vosges	8,798	376
6. Beola granite used in Milan	6,603	282
7. Grey granite of Vosges	6,020	257
[8. *Alum limestone of Maryland*	2,334	100]

The average relative value of the seven granites above cited is 396, or almost four times that of the "alum stone."

10. *Experiments on stones used in the construction of various ancient edifices*, reported by Rondelet, —si..e two inch cubes.

	Lbs. per sq. inch.	Relative value.
1. Caserte stone of Italy	8,584	363
2. Stone of Istria used by Palladio, Sancovino and Scamozze in the edifices of Venice and Vicenze	7,395	316
3. Fourneaux stone, pillars of All Saints Church at Angers	6,317	270
4. Grey stone of Florence	6,096	261
5. Stone of the bridge of St. Maxence	5,404	231
6. Travertin, material of ancient Roman buildings	4,301	183
7. Bagneaux stone, columns of the Pantheon, Paris	3,484	149
8. Stone of the temple of Paestum	3,258	130
[9. *Alum limestone Maryland*	2,334	100]

The average relative value of these ancient building stones is 238.

11. *Experiments on two inch cubes of Basalt and Porphyry, by Gauthey and Rondelet*, reported by the latter in the work above cited.

	Lbs. per sq. inch (Eng.)	Relative value
1. Basalt and Auvergne	29,549	1266
2. Prophyry	28,455	1219
3. Swedish basalt	27,196	1165
4. Basalt of Auvergne 2d variety	25,172	1078
5. do. do. 3d variety	16,416	703
[*Alum limestone*	2,334	100]

The average relative value of the basalts and porphyries is 1086.

12. *Experiments on the alum limestone of Maryland* in blocks of other dimensions than two inch cubes, published by Mr. Dougherty, the superintendent of the Washington National Monument, as having been made at the Navy Yard Washington.

1. A 1-in. cube, (1 sq. in. base)	2000	Average.
2. Another block of same size, do	2000	Expt. 1 & 2 2000
3. A cube of 3½ in. on a side (12¼ base)	3965	
4. Another cube of same siz, do	3765	Expt. 3 & 4 3515
5. A slab 4¼ in. sq. 2in. thick 22.56 base	5629	
6. do. 4¼ sq. 4¼ high, do	2659	
7. A 4 in. cube 16 in. base.	5687	Expt. 5 & 7 5658

The 6th experiment is alleged to have been made on a block of unequal thickness and therefore not to give a fair result.

The first two of the above experiments give results considerably below the average of Dr. Page's trials on two-inch cubes. The only standard with which we can at present compare them, is the one inch cube of the Italian veined marble tried by Mr. Rennie, which gave 3216 lbs. per square inch. Their relative values, by this comparison, are 100 and 160. Comparing the three averages above given, there is an evident increase of strength per square inch of base, dependent apparently in some measure on the increased size of the specimens.

We are furnished by the paper of Mr. W. Wyatt of England with a considerable series of experiments on marbles, granites, and sandstones, tested in cubes of about the same size as the largest of those above given. His investigations were made with the aid of the hydraulic press of Messrs. Bramah & Sons, and in this respect all appear to be comparable with those made on the alum limestone in large blocks. Each of his results is the mean ot two trials.*

To be continued.

* See "Lithology, or observations on stone used for building," by C. H. Smith, p. 22.

† Traite theorique et partique de l'art de batir. ParJean Rondelet, tom. i. p. 21 1-214.

Ohio.

Report of the Board of Public Works.—The productive public works of this State under the control of the Board of Public Works, are the Ohio canal and its feeders, extending from Portsmouth to Cleveland, the Walhonding canal, the Hocking Valley Canal, the Miami and Erie canal, the Muskingum Improvement, the National road, and the Western Reserve and Maumee road.

* See Transactions of the Society of Civil Engineers, vol. i. p. 235.

The receipts of the several works for the past year for tolls, fines, water and rents, were as follows:—

	1850.	1849.
Ohio Canal	$397,332 57	$362,630 48
Walhonding Canal	2,555 09	1,594 72
Hocking "	8,078 67	8,368 57
Miami and Erie Canal	315,162 60	323,764 67
Muskingum Improvement	36,724 29	43,018 70
Total receipts from canals for 1849 and 1850	$759,852 62	$739,377 14

The expenditure on account of the same works for repairs, maintenance, collection of tolls, etc., are as follows:

	1850.	1849.
Ohio Canal	$115,539 48	$141,465 71
Walhonding Canal	1,966 61	2,423 52
Hocking "	11,819 06	10,302 06
Miami and Erie Canal	113,035 29	187,093 23
Muskingum Improvement	39,925 29	56,711 50
Total expenses for 1849 and 1850	$282,285 73	$370,996 02

Showing an excess of receipts in 1850 over 1849 of $20,475 48, and a decrease of expenses of $88,710 29, or a net increase of $119,186 57.

The receipts from the two roads were as follows:

	1850.
National road	$42,636 08
Expenditures for repairs, etc	44,547 19
Excess of expenses over receipts	$1,911 11

	1850.
Western Reserve and Maumee road	$11,568 67
Expenses	8,808 79
	$2,759 88

The canals were kept in good order, with slight exceptions, during the whole season.

The total tonnage on the Ohio canal, which arrived and cleared at Portsmouth and Cleveland for the years 1849 and 1850 is as follows:

	1849. Cleveland.		1849. Portsmouth.	
	Arrived.	Cleared.	Arrived.	Cleared
Wheat & flour	66,458	537	3,262	123
Coal	63,946	207	—	1,057
Corn	14,769	317	5,540	—
Pork, bacon and lard	4,725	5	16,563	26
Iron—all kinds—and nails	9,203	2,752	29	6,392
Lumber	1,445	10,529	254	12
Salt	—	11,083	419	371
Merchandise	1,500	6,606	251	4,614
All other articles	31,468	19,668	8,856	2,751
Totals	193,514	51,704	35,174	15,346

	1850. Cleveland.		1850. Portsmouth.	
	Arrived.	Cleared.	Arrived.	Cleared.
Wheat & flour	75,860	111	4,046	60
Coal	83,851	90	—	1,344
Corn	23,287	659	13,341	—
Pork, bacon and lard	4,785	10	9,447	10
Iron—all kinds—and nails	8,927	8,495	41	6,780
Lumber	1,063	11,944	722	3
Salt	4	9,070	325	138
Merchandise	898	5,456	175	3,990
All other articles	34,054	16,216	11,218	2,763
Totals	232,729	52,048	39,315	15,088

The tonnage on the Miami and Erie canal is as follows:

	1849. Tons. Arrived.	1849. Tons. Cleared.	1850. Tons. Arrived.	1850. Tons. Cleared.
At Cincinnati	104,608	36,216	117,655	42,784
At Toledo	104,566	30,211	122,580	61,391

Below we copy from the report of 1849, the following statistics of the canals of Ohio, which presents an interesting summary of these works:

Names of Canals.	Length in miles	Cost.
Ohio canal, from Cleveland to Portsmouth, including the Columbus Feeder, &c	334	$4,695,203 67
Walhonding canal, from Rochester, on the Mohican river, to Roscoe, on the Ohio canal	25	607,268 99
Miami canal, from Cincinnati to Dayton, including Hamilton Basin	66	1,020,000 00
Warren county canal—from Lebanon to Middleton	19	217,552 16
Miami extension canal, from Dayton to Junction, where it intersects the Wabash and Erie canal	115	2,239,517 92
Sidney Feeder, (part of the same work)	13	392,258 32
St. Mary's Feeder and Reservoir, (part of the same work)	11	528,222 07
Wabash and Erie canal, from Indiana State-line to Manhattan, including Maumee and Toledo Sidecuts	91	3,057,177 24
Hocking Valley canal and slackwater, from Athens to Ohio canal at Carroll.	56	975,481 01
Muskingum Improvement (slackwater navigation) from the Ohio canal at Dresden, to Marietta, on the Ohio river	91	1,627,318 27
Total	821	$15,359,999 6

The chambers of the locks on all the canals are from 87 to 99 feet in length, in the clear, and 15 feet wide—admitting boats 78 feet in length and 14½ feet wide to pass through them. The locks on the Muskingum Improvement have chambers 75 feet long and 36 feet wide; for the passage of steamboats, with the exception of one above Zanesville, which is only 120 feet long and 22 feet wide.

The ascent of the Ohio canal, from Cleveland to the Portage summit, is 396 feet, which is overcome by 43 locks. From Portage summit to Webbsport the descent is 239 feet, which is overcome by 31 locks. From Webbsport to Licking summit, the ascent is 166 feet, which is overcome by 20 locks, and from Licking summit to Portsmouth, where the canal empties into the Ohio, the descent is 419 feet, which is overcome by 55 locks, making the total ascent and descent 1,220 feet, and the number of locks 149.

The ascent of the Miami canal, from Cincinnati to Dayton, is 297 feet—the number of locks 32.

The descent of the Warren county canal, from Lebanon to Middleton, is 46 feet—the number of locks, 6.

The ascent of the Miami extension canal, from Dayton to its junction with the Wabash and Erie canal, is 213 feet, requiring 27 locks—the descent is 235 feet, requiring 27 locks—making the ascent and descent 448 feet—the number of locks 53.

The Wabash and Erie canal, from Manhattan to the Indiana State-line, has an ascent of 176 feet, requiring 26 locks. The Toledo sidecut, a part of the same work, one mile in length, has a descent of 15 feet, requiring two locks—the Maumee sidecut, 2 miles in length, has a descent of 63 feet, requiring 6 locks.

The Walhonding canal, from Rochester to the Ohio canal, at Roscoe, (25 miles in length) has a descent of 90 feet, overcome by 11 locks.

The Hocking canal, from Carroll, on the Ohio canal, to Athens, (56 miles) has a descent of 203 feet, which is overcome by 26 locks.

The Muskingum Improvement, from Marietta, on the Ohio river, to Dresden, on the Ohio canal, (21 miles) has an ascent of 126 feet, overcome by 12 locks and 11 dams.

The average per centum paid by the Ohio canal, on the cost of construction, since 1833, after ducting costs of collections, repairs, &c., is $5 53 on the 100 dollars. The average per cent on the cost of construction on the Miami canal between Dayton and Cincinnati, is $3 83 on the 100 dollars. That of the Miami extension canal, for 3 years past is $1 27 on the 100 dollars. The Wabash and Erie canal, for five years past, $2 58 the 100 dollars. These are the only improvements that have paid expenses.

During the five years ending with the last fiscal year, the Muskingum Improvement has sunk $75,629 32 in repairs, cost of collection, &c., over the above receipts. The Hocking improvement, in the same time, has sunk $9,257 31, and the Walhonding canal, within the past five years, has in like manner cost the State $6,235 59 over and above its entire receipts.

Boardman's Patent Boiler.

Among the many new things of this age of improvements, in this section of the country, we notice one of "Kirk's Patent Steam Hammers," and also one of "Boardman's Patent Improved Steam Boiler's," belonging to Messrs. Myers & Cadwell, and which are now in full and successful operation in the manufacture of car axle-trees, at their forge in Clayburgh. This hammer is so constructed, that it can be made to strike a very heavy or a very light blow, at the will of the operator; and so perfectly is it controlled, that it can be run at the rate of one hundred motions a minute, without even touching the anvil. It in fact rides on the steam. It is worked with one of H. Boardman's patent improved steam boilers. This boiler is an invention of our townsman, Mr. Horace Boardman, and it seems likely soon to take the place of all other steam boilers. It is said to be fully demonstrated that it saves at least fifty per cent of the fuel over all other boilers in use. Believing this to be true, we do not see how it can prove otherwise than of immense value to the public, and especially to persons immediately interested in the generation of steam. Being always pleased to learn of the prosperity of those around us, we are happy to hear of the success that is attending Mr. Boardman's invention.—*Clinton Co. Whig.*

Institution of Civil Engineers.

"On the Construction of the Building for the Exhibition of the Works of Industry of all Nations," by Mr. M. D. Wyatt, Assoc. Inst. C.E.

The subject naturally divided itself into the consideration of the requisites demanded, the design, and the actual construction of the building.

The features of all the buildidgs in which previous exhibitions had been held, both abroad and at home, were then carefully reviewed, and the points of difference between the present cosmopolitan exhibition and all its predecessors were distinctly enunciated, and shown to have induced the invitation to the world at large, to contribute their suggestions for the building, the results of which were shown to the public in the Theatre of the Institution of Civil Engineers, in the two hundred and forty plans there exhibited. None of these plans being found to embrace the necessary requisites, the Royal Commissioners devised a plan, for the execution of which tenders were invited in June, 1850.

The reservation having been made, that *bona fide* tenders for any construction, offering greater advantages than that proposed by the commissioners, would be considered, Mr. Paxton brought forward his proposition; and it being contended, that certain advantages in celerity of construction, facility of removal, the adaptability of the materials to the required forms, and the amount of cost, were inherent in the design for the proposed structure, to be entirely composed of wood, iron and glass, the oth-

er tenders were rejected, and that of Messrs. Fox, Henderson & Co., for Mr. Paxton's design, was accepted.

Such was the origin of the present building, which being adapted to the site selected for it in Hyde Park, by H.R.H. Prince Albert, was shown to consist of a nave 72 feet wide, and 64 feet high, with a series of side aisles, two of 48 feet and six of 24 feet wide, of the respective heights of 43 feet and 23 feet; the whole spreading to a width of 436 feet.

A transept, 408 feet long, and 72 feet wide, intersected the building at right angles in the centre; this transept was covered with a semi-circular roof, springing at a height of 64 feet from the level of the ground, and making the entire height 100 feet.

The details of the construction were very minutely given, from the concrete filling of the holes in the ground, under each support, through the base plate, the columns, 8 inches in diameter, the connecting pieces, to which were attached the girders for the galleries, the second and third set of columns and the roof trusses, the box gutters and the "Paxton" gutters, which latter were intended to provide at the same time for conveying away the rain from the roof, and the candensed moisture from the inside. The total area of the ground floor was equal to 772,784 square feet, and that of the galleries to 217,100 square feet.

Details were also given of the mode of conveying the rain water, &c., into the adjoining sewers, through the interior of the supporting columns; of the ventilation by means of sets of louvres, of galvanized cast iron, placed between the columns of the side aisles, and in the upper part of the roof; of the supply of water for the extinction of fire, and add for the supply of the fountains; and of the experiments for testing the girders and trusses, by the hydraulic press erected in the building, and by which the strength of the whole was proved before they were used.

In examining the power and dexterity with which the design had been realized by Messrs. Fox, Henderson & Co., or, in other words, in the actual construction of the building, it was necessary to bear in mind, that their tender was only verbally accepted on the 26th of July, 1850; that possession of the site was obtained on the 30th of July; that the first column was fixed on the 26th of September; and at the present time (only 145 working days since the commencement) but little of the vast building remained to be finished. To give an idea of the vast size of this building, it was noticed, that the width of the main avenue was within 10 feet double that of the nave of St. Paul's Cathedral, whilst its length was more than four times as great. The walls of St. Paul's were 14 feet thick, those of the glass building in Hyde Park were only 8 inches. St. Paul's occupied 35 years in building, whilst the Hyde Park building would be finished in less than half that number of weeks. The celerity of the construction was very remarkable. As many as 308 girders had been delivered on the ground in one week. Seven of the great trusses of the nave were raised in one day. Each man fixed about 200 superficial feet of glass per day.

In order to perform this work, it was necessary to devise and employ various contrivances for economising labor; such as the sash-bar machine, the gutter machine, the morticing machine, the painting machine, the glazing machine, besides many others of an equally ingenious nature—all of which were described; and, when listening to the details, it was universally felt that England possessed mechanical and physical energies, far exceeding those which gave form and being to the most celebrated monuments of antiquity.

In the course of the paper, Mr. Digby Wyatt, (the author,) to whom, from the commencement, had been intrusted the active superintendence of the construction of the building, paid a well-merited tribute of praise to Mr. C. H. Wild and Mr. Owen Jones, who had been associated with him; to Mr. Barry and Mr. Brunel, who, as members of the Building Committee, had made very valuable suggestions; as well as to Messrs. Fox & Henderson, and to Mr. Brounger, Mr. J. Cochrane, and others, for their exertious in the execution of the construction; and he concluded by reminding the members, that the weight of responsibility, the arduous duty of supervision, the honor of acting as the master mind, to weigh the requisites, to determine the design, and to govern the construction of this great apparatus, has bees reserved for Mr. Cubitt, the President of the Institution of Civil Engineers.—*Prac. Mechanics' Jour.*

The Hydrostatic Log.

The object of this invention is to obtain a register of the speed of ships, by a column of mercury, in such a manner that the height of the column shall depend upon the velocity alone, and not be affected by any disturbing causes; such as alteration of draught of water, pitching and rolling &c.

The principle embraces that of Pitot's tube, inasmuch as the force of the resistance due to the velocity is communicated through a small pipe projecting into the water below the bottom of the ship; this force, acting upwards, compresses a portion of enclosed air in a small cylinder, which air communicating by means of a little pipe with the bulb of a glass tube—bent like a common barometer—raises the mercury in the tube, by depressing it in the bulb.

But as any single column of water and air thus acting upon the surface of the mercury in *bulb alone*, must depend not only upon the resistance due to the velocity, but also upon the *distance of the cylinder from the water line*, which distance or height varies with every sea, and alters more permanently as the dranght of water changes, a compensation was necessary; and the inventor has found one which he considers perfect for all these variations, by applying *a second column of water and air* to press upon the *other surface of the mercury*, viz., that in the glass tube. The second column is precisely like the first as regards the pipe and cylinder, and communicates with the sea by an apeture or apetures, presented in such a direction that velocity does *not produce any increase of pressure*. Thus the mercury in the indicator is placed *between two columns* of water and air, which are *always equal to each other* in length; and the mercury rises according to the *difference* between the pressures upon its two surfaces, the result of resistance or velocity alone.

The air pipes may be conducted in any direction—and the indicator, which swings upon gimbals, may be placed in any part of the ship. The two water pipes are conducted into one tube in the bottom of the ship, divided into two separate chambers for the different forces.

In addition to the speed, the true course or leeway of the vessel is indicated upon a horizontal segment divided into degrees, over which a needle is moved by a rod connected with the above mentioned double tube; and the whole is kept continually in the true direction of the ship's motion by a float or vane attached to the lower end of the tube in the water.—*Proceedings of the Royal Society.*

The Production of Gold in Russia.

The production of gold in Russia was, in 1847, about £4,000,000: in 1848, it was rather more; and in 1849, it was about £3,480,000. The return for 1850 has not yet been published, but in 1848 and 1849 the exportation of gold was prohibited, and in 1850 the state of the exchanges was entirely unfavorable to gold being sent out of the country; on the contrary, a large portion of the 4½ per cent loan contracted at London, was paid in gold and silver. Still, the circulation of gold coin does not seem to have augmented, and, indeed, gold appears but very rarely in the ordinary transactions of business at St. Petersburgh and Moscow. We can only explain this state of things by the accumulation of bullion in the government coffers, and by the diffusion of gold coin through the provinces, and in all parts of this vast empire. The purchases made by the government for the army, etc., being generally liquidated in gold, the Russian half-imperials have lately acquired a large currency in Germany, and it may thus be supposed that a rather important amount of our gold coin has gradually passed into circulation in this manner.

The augmentation of the population, and the increase of comfort, and even luxury, among a large class of the community, will also account for a more considerable absorption of gold; but even all these circumstances taken together, do not sufficiently explain the state of our circulation when compared with the production of Russia, which furnishes so large a proportion of the general production of the globe, excluding California. The production of gold by Russia has, contrary to the assertions made by some newspaper correspondents, been decreasing since 1847, which may in part be attributed to a progressive tax on the produce of the produce of the mines and washings, in proportion to the quantity produced, established since that period. The government possessing a monopoly of the melting of the precious metal, the produce of private mines, yielding more than three-fourths of the total production, is handed over to government, which coins it, or disposes of it otherwise. The Russian government has naturally followed with attention the fluctuations of gold in other parts of Europe; but the recent prohibition of the exportation of gold seems to indicate that it will not meddle with the position of its gold coinage.—*St. Petersburgh Journal, Feb.* 8.

From Appleton's Mechanics' Magazine.

The Application of Iron to Railway Structures.

Continued from page 179.

Power of beams of cast iron to sustain long-continued impact.—"The effect of impect and vibration upon structures was a leading object of inquiry with the Commission; and the first series of experiments instituted upon this subject was, to determine the power of beams to sustain impacts many times repeated. For this purpose sixteen bars were cast, and five at least of the sixteen were found to be slightly defective at some place where they gave way. Whether these small defects were more numerous than would be found in practice, it would be difficult to determine. Six of the bars were 15 feet long and 3 inches square, and placed on supports 13 feet 6 inches asunder; seven were each 10 feet long and 2 inches square, and 9 feet between the supports; and three were each 5 feet long, 1 inch square, and 4½ feet between the supports. Of these bars six were bent through one-third of their ultimate deflection at each blow, and five of them bore each 4000 blows without breaking; the sixth was broken at a flaw with 1,085 blows. One large bar bent by impact through five-twelfths of its ultimate deflection, was broken at a defective place with 1,350 blows. Of six bars bent by blows through half their ultimate deflection, five were broken with less than 4000 blows each; one with 29; another with 127, &c. The only bar which bore the 4000 blows was one of the smallest kind, or 1 inch square. Of three bars, one bent to seven-twelfths, and two to two-thirds the ultimate deflection, all were broken; the two latter with 127 and 474 blows respectively; the former required 3,700 blows to break it. Of ten bars of Low Moor Iron No. 2, each ten feet long and two inches square, placed on supporters 9 feet asunder, and struck in the middle with long continued imparts, as before, four broke at defective places, and two at sound ones. Three were subjected to impacts bending them through one-third of their ultimate deflection, and bore the test without fracture; of three bent by blows through half their ultimate deflection, two were broken; those bent through two-thirds were all broken. On the whole, it appears *that no bar but one, and that a small one, stood* 4000 *blows, each bending it through half its ultimate deflection; but all the bars, when sound, stood that number of blows, each bending them through one-third their ultimate deflection.* It must, however, be borne in mind, that a cast iron bar will be bent to one-third of its ultimate deflection with less than one-third of its breaking-weight, laid on gradually; and one-sixth of the breaking weight laid on at once, would produce the same effect, if the weight of the bar was very small compared with the weight laid on it. Hence the prudence of always making beams capable of bearing more than six times the greatest weight which will be laid upon them." Mr. Hodgkinson makes the following,

Remarks on some of the leading results of horizontal impacts upon cast iron beams:—"1st. The bars in tables I., II., and III., were of the same sectional area, length, and weight, nearly, but differed in the form of their transverse section. They were placed on supports at the same distance, 13½ feet asunder, and struck horizontally by the same ball, 603 lbs. weight, suspended by a radius of 17 feet 6 inches.

From the results, it appears that *the beam 3 inches square, and the rectangular beams* 6 by 1½ *inches section, struck on the broader and narrower sides respectively, had all very nearly the same strength to resist impact.* These conclusions are drawn from a mean between two experiments in each case. In table XV., six bars, each 2 by 1 inch section, and 5 feet long, were laid on supports 4½ feet asunder, and all struck by the same ball, 75¼ lbs. weight, with arcs of a radius 17 feet 6 inches. Three of them were struck on the broader and three on the narrower sides, and their mean chords of impact to produce fracture were 70 inches and 71.67 inches respectively, or nearly the same, agreeing with the results of the experiments upon the former bars."

"2nd. In table IV. the bars were of the same dimensions in section as those in table I., or 3 inches square, but the distance between the support was reduced one-half. The resulting breaking deflection 1.23 inch, was somewhat greater than one-fourth of that in table I., or 4.875 inches, and the vertical descent to produce fracture was nearly one-half, but rather more, the depth fallen through in the two cases being 639 inch and 1.238 inch. Comparing, in like manner, the half and whole bars in tables V. and II., the depths are 5521 inch and 1.2071 inch respectively. This result, coupled with the former one, shows that the depth fallen through to break the half bar is nearly half of that required to break the whole one. Comparing the results in tables VIII. and XII., and also tables X. and XIII., it appears also that a bar of half the length of another resists with nearly half the energy, but somewhat more.

"3rd. The experiments in tables I., II., III., IV., & V., afford illustrations of some of the conclusions in the large generalization of Dr. Young, deduced from neglecting the inertia of the beam. (*Nat. Phil. Lecture XIII.*) 'The resilience of a prismatic beam, resisting a transverse impulse, follows a law very different from that which determines its strength, for it is simply proportional to the bulk or weight of the beam, whether it be shorter or longer, narrower or wider, shallower or deeper, solid or hollow. Thus a beam 10 feet long will support but half as great a pressure without breaking, as a beam of the same breadth and depth which is only 5 feet in length; but it will bear the impulse of a double weight striking against it with a given velocity, and will require that a given body should fall from a double height in order to break it.

"4th. The experiments in table VI. were made to compare the effects of striking a bar midway between the centre, and one support with those of striking similar bars at the centre, as in table IV. The great impacts, so near to the support in these cases, would necessarily cause it to yield slightly, and thus increase the resisting powers of the bars to sustain impact. In experiments made by the author several years ago, given in the fifth report of the British Association, page 112, on bars one inch square, some subjected to impacts in the middle, and others at half the distance between the middle and one support—the cord of impact necessary to produce fracture was nearly equal in the two cases. The ratio of the deflections, from equal impacts at the middle and at one-fourth span, was nearly constant under different increasing degrees of impact; the deflections at the middle from equal impacts being those at one-fourth span as 10.7 nearly. The relative ultimate deflections of the beam in the middle, and at a point half way between the middle and one end, ought to be as 10: 7.5 nearly.

"5th. The bars in tables VIII., IX., and X., were all of the same iron and size, and the only difference was in the weight of the striking balls. The distances fallen through, and the work done by the balls to produce fracture being respectively .3159 and 190 488 with the 603 lb. ball, 1.2856 and 195,447 with the 151¼ lbs. ball, and 3.0506 and 230 32 with the 75¼ lb. ball, affording a good illustration of the resistance from the weight of the bar.

"6th. The bars in table XI. were of the same iron as the others, but remelted, to ascertain the effect of melting this iron a second time, without mixture, upon its power to bear impact. The strength to resist blows was increased, but the iron was harder and much more unsound than before. The work done by the ball to break the beam in each case was increased in the ratio of 261 to 194.

"7th. The deflections in cast iron beams were always found to be greater than in proportion to the velocity of impact; whilst in wrought iron they were nearly constant with impacts of very different velocities. This fact shows that there is a falling off in the elasticity of cast iron through impact, analogous to that through pressure. The difficulty of obtaining a satisfactory theory of the power of cast iron beams to sustain impact is considerably increased by this falling off in elasticity, but it is hoped that the varied nature of these experiments will tend much to reduce it."

Appendix B contains a report of experiments for determining the effects produced by causing weights to travel over bars with different velocities, made in Portsmouth Dockyard, and at Cambridge, by the Rev. R. Willis, F.R.S., Jacksonian Professor, &c., Capt. H. James, R. E., F.R.S., and Lieut. D. Galton, R.E., together with experiments made in Portsmouth Dockyard on the strength of rectangular bars of cast iron; on the effects of reiterated depressions of iron bars, by traversing weights, &c. &c., with a "Preliminary Essay," by the Rev. R. Willis, on the effects produced by causing weights to travel over elastic bars. The bars in all the experiments were laid in parallel pairs, and tested by passing a loaded car at various rates of velocity over them. The first series of these experiments were made with bars of cast iron 9 feet long between the points of support, 1 inch broad and 2 inches deep. The weight of the load was increased at each transit till one or both of the bars broke, the velocities being obtained by letting the car run down an inclined plane from various heights. In *Experiment No.* 4, the car at rest on the centre of the bars, weight 1120 lbs., caased a deflection of .88 inch, and a set of .20 inch. The same load impelled at the velocity of 15 feet per second, or 10.2 miles per hour, produced a central deflection of 1.24 inch, and a set of .21 inch. 1760 lbs. at the same velocity produced a central deflection of 3.00 inches, and a set of .91 inch. An untimate load of 1876 lbs. broke one of the bars. *Experiment No.* 5, load 1120 lbs. at rest, deflection at centre .86 inch, set .25 inch. Same load at velocity of 10.2 miles per hour increased deflection to 1.11 inch, the set remaining the same. A load of 1844 lbs. increased the deflection to 4.17 inches, the set to 1.59 inch, and eventually broke one of the bars. In *Experiment No.* 6, a load of 1120 lbs. at rest on centre of bars produced a deflection of .62 inch, and a set of .12 inch. The same load, passed at the rate of 10.2 miles per hour, increased the deflection to .74 inch, with the same set as before; a load of 1792 lbs. at the same speed deflected the bars 2.90 inches, with a set of .67 inch; and a load of 1816 lbs. broke one of the bars. In *Experiment No.* 7, a load of 1120 lbs. at rest upon the centre of the bars caused a deflection of .64 inch, and a set of .12 inch. The same load propelled at the velocity of 24 feet per second, or about 16¼ miles per hour, increased the central deflection to 1.02 inch, and the set to .15 inch. A load of 1412 lbs. at the same speed produced a deflection of 3.16 inch, and a set of .72 inch; and a load of 1440 lbs. broke both bars. In *Experiment No.* 8, 1120 lbs. at rest on centre as before, showed a deflection of .65 inch, and a set of 11 inch. A velocity of 24 feet per second increased the deflection to .87 inch, and the set to .14 inch. 1496 lbs., at the same velocity, produced a deflection of 3.94 inches, and a set of 1.07 inch; and 1524 lbs. broke both bars. In *Experiment No.* 9, a load of 1120 lbs. at rest on the centre, deflected the bar .74 inch, with a set of .18 inch. The same load at a velocity of 24 feet per second, caused a deflection of 1.14 inch; and 1580 lbs. at the same velocity, produced a deflection of 3.08 inches, and a set equal to ·68 inch. 1604 lbs. broke both bars. In *Experiments* 10, 11 and 12, 1120 lbs. at rest, showed deflections from .95 to 1.17 inch, and a velocity of 29 feet per second, or nearly 20 miles per hour, increased them from 1.80 to 2.54 inches. The breaking-weights varied from 1204 to 1240 lbs. at the same velocity, and the greatest observed deflections from 1.80 to 3.36 inches. In *Experiments* 13, 14, and 15, the velocity was increased to 33 feet per second, or 22½ miles per hour, the statical deflections being from .81 to 1.30 inch, the breaking loads from 1148 to 1288 lbs., and the last observed deflections from 2.67 to 3.65 inches. In *Experiments* 16, 17 and 18, the velocity was increased to 36 feet per second, and the greatest breaking-weight was 1204 lbs., the maximum observed deflection being 2.31 inches.

The Second Series comprised 15 experiments upon bars 9 feet long between the supports, 1 inch broad, and 3 inches deep. The breaking-weights at rest on the centre varied from 4126 to 4388 lbs., the maximum central deflection being 2.71 inches. With a velocity of 16 feet per second, the greatest breaking-weight was 3496 lbs., and deflection 2.70 inches. A velocity of 29 feet per second reduced the breaking-weight to 3167 lbs.; 36 feet per second reduced it to 2468 lbs., greatest deflection 2.08 inches. A velocity of 43 feet per second reduced the greatest breaking-weight to 2242 lbs., deflection 1.87 inch. From these results, it appears that a small load moving at a great velocity breaks a bar before it has suffered the whole of the deflection which a greater load produces, moving at a less velocity.

To be continued.

U. S. Mint.

The North American furnishes the annexed statistics of the operations of the Mint:—

We are indebted to E. C. Dale, Esq., Treasurer U. S. Mint, for the subjoined statement of the coinage and operations of that institution for the month of March. It will be observed that the coinage during the month reached the unprecedented sum, we believe, of $6,298,672. Tnis fact demonstrates the present working facilities of the mint to be equal to any emergency, in meeting the demands of the country, that may possibly arise. The total coinage of the year thus far, amounts to $14,119,213. In order to show the coinage in each of the past three months, and the total aggregate, we have compiled the following table, which, as the export of gold has commenced at New York, may possess some interest for our commercial readers:—

	Gold.	Silver.	Copper.	Total.
January ..	$2,620,966	$76,950	$7,277	$2,705,705
February .	5,082,987	15,500	16,861	5,115,348
March.. .	6,285,735	6,400	6,537	6,298,672
Total..	$13,989,688	$98,850	30,675	$14,119,213

The deposites, during the same period, of the precious metals, were $10,687,100, of which $10,671,000 was in gold and $16,100 in silver. Of the gold, California contributed $10,434,000, as will be seen by the annexed table:

January.....	$4,940,000	$60,000	
February.....	2,860,000	140,000	7,700
March.....	2,634,000	37,000	8,400
Total.....	$10,434,000	$237,000	$16,100

COINAGE IN MARCH, 1851.

Gold Coinage.

		Value.
284,197	Double Eagles.....	$5,683,940 00
48,663	Half Eagles.....	243,315 00
38,104	Quarter Eagles.....	95,260 00
263,220	Gold Dollars.....	263,220 00
634,184	pieces.....	$6,285,735 00

Silver Coinage.

128,000	Half Dimes.....	$6,400 00

Copper Coinage.

653,799	Cents.....	$6,537 99
1,315,983	pieces.....	$6,298,672 99

Total gold bullion deposited for coinage, from 1st to 31st of March, 1851, inclusive:

From California.....	$2,634,000 00
From other sources.....	37,000 00
Total.....	$2,671,000 00
Silver bullion deposited in same time.....	$8,000 00

All deposits made at the Mint since March 11th have been paid promptly on the ascertainment of their value, and a large surplus of coin has been accumulated in the Treasury; the amount now on hand, available for payments, is over $2,000,000. Deducting $500,000 for old deposits payable but undrawn, and $200,000 for deposits not ascertained, and we have a surplus beyond all demands of $1,300,000.

Preparations are making for a large issue of

three cent pieces from the Mint at an early day. By authority from the Treasury department, a great part of the silver bullion fund will be converted into these pieces; and after receiving a sufficient supply for the various government offices, the balance will be exchanged for deposits of foreign silver coins or bullion, and also *for American gold and silver coins.* A fund is likewise provided for procuring future supplies of silver bullion for this coinage, so that all the public demands may be promptly satisfied. To prevent undue accumulation of these coins in single hands, a discretion is allowed to decline selling more than $150 worth at a time to one applicant. The least am't to be sold is $30 worth. Authority is also given to deliver the coins in distant cities, at the cost of the Mint for transportation, as is now the case in distributing the copper coinage. Notice will hereafter be given of the time at which applications for the new coin will be received.

Freight on Coal Roads and Canals.

The reduction made by the Reading railroad company, a few days sinee, in the tariff of charges, has been followed by a corresponding reduction in the charges of all other companies. Schuylkill navigation company, Lehigh navigation company, Delaware division of Pennsylvania Canal, Lehigh Canal Company, and the Delaware and Hudson Canal Company, have all made their rates lower than those of last year. The price of coal has, however, fallen more than the freight. To give some idea of the spirit of competition prevailing, we annex the prices to be paid for Lackawanna coal, delivered on board vessels at Rondout, during the period of canal navigation in 1851, subject to the specified conditions:

	To July 15.	*Sept.* 15.	*After Sept.* 15.
Lump coal.....	$3 30	$3 40	$3 56
Grate do. or large broken	3 45	3 55	3 65
Slide dock do. or range.	3 40	3 50	3 60
Pea coal or Pea&Chesnut	2 65	2 75	2 85

With fifty cents per ton added to these rates, it is understood the coal will be delivered from Rondout to New York city, making the price of anthracite, in New York city, $3 80 per ton. The company, however, "does not bind itself to the price &c. now offered, for any definite period; but reserves to itself the right of advancing the price or making any alteration it may deem proper, until orders are given and accepted in writing."

The Note of Preparation:

About five hundred canal boats, barges, &c,, have been laid up, during the past winter, in the Atlantic Dock Basin. They were placed abreast each other, in regular "tiers," and though in close contact, covered an area equal to several acres.—The families of the boatmen who have passed the winter in these floating dwellings, are sufficient in number to form a respectably sized town. About twenty boats have left the basin within a short time, and much activity is displayed by the whole flotilla in caulking, painting, &c., preparatory to the commencent of business on the 15th instant, when the canals are to be opened. Some eastern freight has offered, but little or no western. In this particular, the spring forwarding business is rather more backward than usual.—*New York Journal of Commerce.*

Scrantonia.

A correspondent of the Pittston Gazette, under date of March 4th, says:

As most if not all the readers of the Gazette are aware, a railroad, starting at this point and intersecting the York and Erie road at the Great Bend, near Binghamton, is in course of construction on or before the 4th of July next. In connection with this road, large and commodious workshops are being erected near its terminus in this place, the largest of which when completed will be 350 feet in length by 200 in width, sufficiently large to admit the employment of from four to six hundred mechanics. These shops are intended for the construction and repairing of locomotives, cars, and the general equipage of the road. This department is under the superintendence of D. H. Dotterer, Esq., formerly of Reading.

In close proximity to the depot, a hotel of extensive dimensions, to contain two hundred rooms, is to be erected the coming season, at an expense of twenty thousand dollars. The funds have been secured by selling stock for the required amount.

Maryland.

We copy from the *Cumberland Civilian*, the following account of what is doing in that quarter, in reference to Railroads:—

Railroad Extension.—The Mount Savage Company are now engaged in extending their railroad, up the valley of Jennon's run to the valuable properties at the foot of the hills in the vicinity of the town of Frostburg. The substitution of a regular track for the present tram road will be of immense advantage in facilitating the delivery of the coal of the Frostburg, Allegany and other mining companies at the various canal basins at this place.

Laying the Track.—We notice that the rails are being laid on the extension of the Baltimore and Ohio railroad, west of Cumberland. The plan adopted by the company is to carry the rails on the track as it is laid, and thus deliver them as wanted along the line. In this way some four or five miles have been finished, and already has the steam whistle been heard in the valley of the Potomac above Cumberland.

New Railroad—We are gratified that the Georges Creek coal and iron company are about to construct a railroad from their valuable property at Lonaconing, to intersect the Baltimore and Ohio railroad at some point near Westernport, probably the Piedmont station. The road will be nine or twelve miles in length, according to the point of intersection finally fixed upon. It will be commenced immediately under the direction of Wm. H. Smith, engineer and superintendent of the Company, and, when finished, will open the rich coal properties in the George's Creek valley that are now without any outlet to market. We regard this as a very important improvement and have no doubt that it will be prosecuted with energy and vigor until completed.

Kentucky.

Lexington and Maysville and Lexington and Danville Railroad.—The proposition recently submitted to the people of Fayette county, to subscribe $200,000 to each of the above roads, to aid in their construction, has been answered in the affirmative by the following majorities:—

	Maysville Road. For.	Ag'st.	Danville Road For.	Ag'st.
Lexington	1226	427	1104	473
Athens.....	40	135	31	137
Yarnalton.....	4	96	3	97
	1270	658	1138	707
	658		707	
Maj. M. road.....	612	D. road	431	

French's Locomotive.

The legislature of Virginia, some time since, appointed a committee to examine the invention of Mr. French, and report upon its merit, and the practicability of its adoption. The report, portions of which we give below, is favorable to the claims of the inventor; and upon its presentation, the House of Assembly passed a resolution, which however, was not concurred in by the Senate, authorizing the construction of a road not over five miles in length, upon the principle of the invention. We copy from the report the following account of the experiment, with a description of the track and the machinery:—

"The road is constructed on the Manchester side of the river, a few hundred yards above the Petersburg road; is about 1900 feet in length, and, with the exception of 100 feet at the lower extremity, rises the remainder of the distance about 200 feet to the mile, the incline being nowhere less than 1 foot in 30. The road differs but little from the common railway with wooden superstructure. The same sized timbers are used, and the string pieces, instead of being secured by wedges as is usual, are notched into the sills and secured by iron bolts—the ends of the sills are cut off flush with the sleepers, and the iron, which is a flat bar 6 inches wide, ¾ thick, is placed on the outer edge of the string piece, projecting over it 2¼ inches. The road has a very firm and solid appearance, and the iron has in no way been displaced by being used. The ends of the sills being cut off flush with the sleepers, and the iron projecting over 2¼ inches, there is thus formed a free and open space the depth of the sills and string pieces for the wheels to play revolving up against the rails.

The driving wheels of the engine are cast solid and concave, the cranks are fixed on the outer ends of the axle, and between the cranks and the inner surface of the wheels, suspended from the axle, are the friction wheels which revolve upon the rails. These friction wheels by means of a compound lever, the long arm of which rests by the side of the engineer, are pressed up against the rails, and the axle of the driving wheels being the fulcrum, the driving wheels are pressed down upon the rails and made to produce any requisite degree of adhesion. In this consist the chief features of the invention.

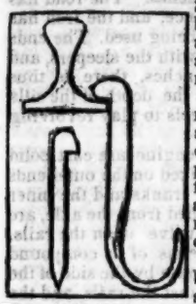
The friction wheels, when not in use, assume by their gravity a position about one inch below the rails, and pass freely along without rubbing or touching either the iron or the road. When brought up against the rails they partake of the revolving motion of the driving wheels above, and by means of springs accommodate themselves to any varying thickness in the iron. In addition to this, by means of a small steam cylinder, they are made to pass at pleasure from under the rails, and assume a position some inches above them, the engine different then in no way from the common locomotive.

The machinery on the road consists of an engine and a passenger car capable of seating sixty passengers. The engine has attached to it a small water-tank, and weighs about 3¼ tons; its driving wheels were 32 inches in diameter, cylinders 8 inches, with 16 inch stroke. The committee have examined the working of the engine, and have been repeatedly drawn over the road, and have witnessed experiments enough to convince them that, by means of Mr. French's invention, a far greater adhesion is rapidly produced than is due to the weight of the engine, and that the apparatus is entirely manageable and convenient. In simplicity, ease of application, and effectiveness, this invention excels all the ingenious contrivances hitherto proposed for attaining similar ends. On a road on Mr. French's plan, any locomotive engine runs readily, and the common railway, to take advantage of this principle of adhesion, would have to be changed only on the inclines."

The committee report that the engine was unable to ascend the grade without the friction gear, but immediately started forward upon its application. This was repeatedly tried, not only on one, but on almost every part of the plane, and always with the same result. The power of the engine, the exact value of the mechanical adhesion, was not exactly ascertained. As many as one hundred passengers at a time have been drawn over the plane, at a speed of twelve to fifteen miles an hour, the train all the time, both in stopping and starting, being perfectly manageable. The brake and friction rollers were disengaged after ascending the plane, and the train allowed to run down (the point where the brake was applied being marked) in order to make an estimate of the resistance occasioned by the brake. After it descended a hundred yards or more, the brake was applied, and the train was readily stopped. The velocity in the ascending was at least 12 miles per hour. The friction rollers were examined, and "they were well supplied with oil and not at all heated," so far as the committee could ascertain. The report states that the great end attained by the invention is the reduction in the disproportion between the paying freight and the dead weight, and that they believe this end has been fully accomplished.

Railroad Spikes, Wrought Chairs and Fastenings.

THE subscribers continue to manufacture, with increased facilities, Hook and Flat Head Railroad Spikes and Chairs. The points being FINISHED BY HAND, have a long taper, and sharp point, and are much superior to those made entirely by machinery.



We are also prepared to furnish Wrought Chairs, Clamps and Fastenings of every description, either punched or plain. The best quality of refined iron is used in the above articles, and our prices will be made as favorable as any in the country.

The patent Clinch Spike will be found an improvement to secure the rail at the joints.—They drive in the manner shown and are not liable to work loose.

All communications, addressed to the undersigned, will meet with prompt attention.

SMITH & TYSON,
No. 25 South Charles st., Baltimore Md.

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Baltimore City Rolling Mill, (Works of Messrs. Ellicott) also agents for the sale of the Laurel, Locust Grove and Gunpowder (Balt.) Forge Pig Irons; Hupp,s Cold Blast Columbia Wheel Iron, Fort and anti-Eatam Pig Irons. Caledonia, Columbia and Capon Cold Blast Boiler Blooms, warranted; Wm. Jessop & Son's Steel; Old Colony and anti-Eatam Nails; Bar Iron, Boiler Plates, Hoop, Sheet, Oval, Half Oval, Horse Shoe and other Iron.
Exchange Place, Baltimore.

AMERICAN RAILROAD JOURNAL.

Saturday, April 5, 1851.

The Stock and Money Market.

Since our last a favorable change has taken place in the stock and money market. Prices have improved, under a growing confidence that money is to remain abundant. Large orders for the shipment of specie have been countermanded. The mint has thrown into circulation the large amount of gold which had accumulated there. Foreign exchange is abundant, trade has generally improved, and every thing indicates an abundance of money during the coming season. Railroad securities begin to share in the general improvement; but we would advise those having such to offer, not to offer them till a further improvement shall have taken place. The coming bids fair to be a very prosperous season. The receipts of our roads are greatly in advance of any former year, and this will tend to create increased confidence in bonds and stocks; and the increased volume of agricultural products which our rapidly extending public works are throwing upon the market, will largely add to our means for their further prosecution.

A good deal of interest is felt in this city and the State, in reference to this institution, the object of the organization of which, is to compel country banks to redeem their bills in this city; or in other words, to introduce into the banking operations of New York the same system of par redemption which has so long prevailed in the New England States.

The system which prevails there is simply this: all the banks in those states have mutually entered into an agreement to make their bills equal to specie in Boston, the great monetary centre of the country in which they are situated. As a part of this agreement, the Suffolk bank takes up, or redeems, all the bills of all the banks that are parties to this agreement, for which service it receives a small compensation. As fast as the bills are received, or at stipulated times, the country banks are notified, and are obliged to redeem their notes in specie, or in current notes of other banks.

Such are the main features of the *Suffolk Bank system*, which is attempted to be introduced into this city, through the agency of the Bank of the Metropolis.

The advantages of this system of redemption are apparent at once. It gives to the notes of all banks that are parties to the arrangement the attribute of *specie* funds, at the counter of every bank in New England. The bills of any bank in any State, are as good in the payment of a note as are those of the bank receiving the money. A merchant in Eastport, Maine, pays his notes with the bills of the New Haven, Conn., banks, just as well as with gold and silver. He requires no intervention of a broker, neither are his pockets stuffed with every variety of uncurrent funds, of every degree of value. With the Suffolk system, the currency of New England therefore always possesses the attribute of *money*, because it is always, and without cost to the holder, convertible at will into gold and silver, which are alone recognised as a legal tender.

That it is of very great advantage for the community, that bills of banks should always possess the attribute of instant convertibility, requires no argument to prove. The saving effected by this is measured by the amount paid to brokers to redeem, and by the time wasted in effecting this—no inconsiderable item. By the "Suffolk system," all this burden is borne by the *banks*. In New York it is thrown upon the people. It is the object of the Bank of the Metropolis to throw this burden where it belongs—upon the banks themselves. It is simply compelling them to make their bills, what they purport to be, *money*, wherever they circulate. If banks put out their bills as money, and receive for them, money, what injustice or hardship is there in compelling them to make their bills equal to money, instead of throwing this burden upon the people?

As a popular measure, therefore, its adoption would be a very useful one to the community at large, in relieving it of a burden which is a severe tax upon every business man. But this is not all. The adoption of a system similar to the one proposed, is absolutely necessary to protect the public against the extravagant issues, and consequently unsafe management of banks. In New England, the books of the Suffolk bank show the weekly issue of the several country banks, with nearly as much accuracy as the books of such banks. If these receipts are beyond the regular and safe limits, this suspicious circumstance at once receives attention, and calls forth inquiry and investigation as to the cause of such excess. And if no good reason can be shown for it, the public are immediately, and very properly, cautioned against receiving its bills. The bank making the over issues is at once called upon to make good its account, and if it cannot do this, it then becomes the subject of legal interposition. With the check which this system imposes, no bank can long go on beyond its regular means. It detects the first symptom of weakness, and exposes the danger, in most cases, before the public can be harmed.

In New York, to be sure, the bills of most of the banks are secured by a deposite of State stocks, so that no loss, as a general thing, can happen to the bill holder. This may be very true, and at the same time a bank may do itself, and the public, great injury, by issues beyond the wants of business. The abundance of money should, in the long run, bear an uniform relation to the amount of property in a community to be moved from hand to hand. All issues of banks beyond the amount required for this purpose, promote speculative movements, and create an unhealthy state of things. The sole office of money is to effect an exchange of commodities. Bank bills are not property, but merely the representative of its value. The notes of a merchant are not property, but merely promises to pay, and where in either case the issue respresents a sum larger than the property possessed by such bank or merchant, and more than they severally can pay, the holder of such notes or bills is not justified in treating them as property, and in incurring liabilities upon the strength of such. His means are in supposition only, and he becomes involved in the embarrassment of those upon whom he is trusting. Under the Suffolk system, a bank cannot keep up a circulation beyond the regular wants of the community it is doing business for. Its bills, the moment they are issued, flow at once to the monetary centres, where they must be redeemed by current funds.—Banks are in this way prevented from throwing a fictitious capital upon the community, to become the basis of new schemes of speculation, or business not called for, nor justified by the amount of property which actually exists.

We consider, therefore, the introduction of the Suffolk system into this State, as of the highest importance in the tendency it would have to regulate and confine within a proper limit, the issues of banks, and to prevent their becoming the instruments of speculation, and to relieve the community of the immense tax now paid for the redemption of bills. As far as parties are concerned, the banks are on one side and the people on the other. We rejoice in the attempt that is about to be made to improve our currency, and we trust that it will be entirely successful.

SALES OF STOCK IN NEW YORK.

	April 2. Sales.	March 26. Sales.
U. S '67 Loan.....	116	116
Erie R.R.....	84	79⅛
Harlem R.R.....	70½	67½
Stonington.....	43	41
L.I. R.R.....	24	22½
Norwich & Wor....	64	61½
Del. & Hudson.....	129½	129½
Reading	56½	54½
Morris Canal.....	18⅛	18⅛
Erie income	93⅛	92½
" " Bonds.	103	104
Canton.....	65	62
Farmers Loan.....	65½	64

SALES OF STOCKS IN BOSTON.

	April 1.	Mar. 25.
Old Colony Railroad.....	68½	68⅛
Boston and Maine R.R.	104½	105⅛
Eastern Railroad.....	102	103½
Fitchburg Railroad.....	111⅛	111½
Michigan Central Railroad.....	94½	92
Northern Railroad.....	70⅛	70⅛
Vermont Central Railroad.....	34½	34½
Vermont and Mass. R.R..-.....	31	28½
Western Railroad.....	103½	104⅛
Ogdensburg Railroad.....	38½	38½
Rutland Railroad.....	57½	58½
Boston and Worcester Railroad.	103½	103⅞
Rutland Railroad Bonds....	97	85
Ogdensburg Railroad Bonds.....	97½	99
Vermont Central R.R. Bonds....	92½	92
Boston and Providence R.R.....	83½	84
Philadelphia, Wilm'gton & Balt.	29	29½
Concord R.R.....	56	56
Manchester and Lawrence.... ..	90	90

Ohio.

Akron Branch Railroad.—The following gentlemen have been recently elected directors of this road:—Simon Perkins, J. W. McMillen, M. W. Henry, H. A. Miller, E. N. Sill, James Butler, H. N. Day.

The officers of the board are Simon Perkins, President; J. W. McMillen, Treasurer; H. N. Day, Secretary.

Pennsylvania.

Central Railroad.—The Northern Liberties corporation have subscribed $500,000 to the Central railroad. The sum of $1,500,000 has already been subscribed by the city of Philadelphia, leaving but $1,000,000, which it is said will be speedily taken, to complete the sum of $3,000,000, necessary to carry the road over the Alleghanies.

The Philadelphia Pennsylvanian says that the contractors are now busily engaged in laying the rails on the Central road, between Johnstown and Lockport, in Westmoreland county. It is expected that the cars will be running west as far as Lockport, which is 26 miles east of Greensburgh, by the 1st of July next. It is believed that the road will be completed to within eight miles of Greensburgh by the first of October. The heavy cutting and tunnelling at Greensburgh will probably prevent the cars from running through from Philaeelphia to Pittsburg before the spring of 1852.

East Tennessee and Georgia Railroad.

Twelve miles of the Georgia and East Tennessee railroad are in full operation. Forty miles will be finished to the Hiwasse by the 1st of June. The road will reach Athens by the 10th of October.

Ohio.

Cincinnati and Belpre Railroad.—The Chillicothe Gazette says that the committee of the Belpre railroad have contracted with the house of Cushing, Wood & Co., Boston, for the construction of the line of their road, from Greenfield, Highland county, to a point eleven miles east of Chillicothe, in Ross county. They are to grade the line and prepare the rails, the bridging only excepted, and a large portion of the payments is to be made in the stock of the company. They were the lowest bidders out of sixty competitors.

European and North American Railway.

The Halifax Sun speaking of the mission of Mr. Howe, the Provincial Secretary, now in England, for the purpose of obtaining the aid of the home government for the above work, says:—

"We have it on the most reliable authority, and hasten to lay before our fellow citizens the gratifying news that the whole affair of the railroad has been settled. The mission of the Hon. Mr. Howe has been entirely successful. The British government had consented to guarantee the whole amount to build the railroad to Quebec and Montreal, at 3½ per cent. Mr. Howe was in great spirits, nor was it at all apprehended that any change of ministry contingent upon the unsettled state of parties, could in any wise affect the negotiations, which had been virtually brought to a close. The local provincial government have the power to connect with any branch railroad to the American territory."

The Province of New Brunswick has appropriated the sum of $1,250,000 in aid of the above work through her territories, and proposes to commence work upon this division in the month of June next.

This great project is moving forward with extraordinary rapidity, and we shall soon see every portion of it under construction.

Pennsylvania.

York and Cumberland Railroad.—The bill fixing the tax on freight carried over this railroad passed the Senate of Pennsylvania on Monday. The rate is three mills per ton per mile, the same, we believe, as that charged on the other public works of Pennsylvania. Attempts were made to raise the rate to fifteen, then twelve, and then ten, but they all failed by decisive votes. In the passage of this bill we have an earnest of that wise and national policy which should ever control the counsels of the States, that looks to the benefit of the whole people, and will not allow itself to be controlled by State lines and local influences.

Mr. Asa Whitney.

This gentleman sailed for England in a late steamer, for the purpose, it is said, of laying before the British government, his plan for building a railroad across this continent. It is also stated that Mr. Whitney has, for some time past, been receiving overtures from that power to transfer his plan from the American to the British territory, and make the latter the route through which the commerce of the world is to flow. Mr. Whitney, according to the journals devoted to his interests, has for a long time turned a deaf ear to all solicitations from abroad, in his desire to secure to his own country the vast boon which he had to bestow. But as our people ungratefully refuse to accept it, and the infinite blessings which are to follow in its train, Mr. Whitney, worn out by our ingratitude, has now turned his back upon us, and has gone to sell *our* birthright to our rival and ancient enemy!

All this is very fine talk. Mr. Whitney's going to Europe is undoubtedly a mere *ruse*, to operate upon Congress during the next session. Until that assembles, he can as well be in England as the United States. In the meantime, he can fabricate the last great humbug of politicians or supplicants for government patronage, some story of British aggression or interference; or some design to secure to herself a monopoly of right of way across this continent, to operate further upon popular credulity.

But if Mr. Whitney has gone to England for the purpose of placing his plan before the English government, it only proves the delusion under which he is laboring. The idea of constructing a railroad around the head of Lake Superior, to make that the route of travel and commerce across the country, is too preposterous for any sane man to entertain. To urge this, shows how utterly wanting he is in a proper appreciation of the difficulties, and uses of such a work.

We freely admit that Mr. Whitney possesses some qualities which eminently fit him to head a great enterprise. He is enthusiastic, and possesses to a remarkable degree the capacity of inspiring others with his own views. He is deterred by no obstacle, and discouraged by no defeats. But here his qualifications for conducting to a successful issue a work of such immense magnitude as that of a railroad from the Atlantic to the Pacific, end. He is self-confident without experience or training, arrogant in his opinions, and overbearing towards all who differ from him. He has a hearty contempt for the whole engineering profession, and loses his temper the moment that one of that class talks about tunnelling, bridging, excavating, etc., which are certainly the great annoyances in railroad construction, and which have made others, besides Mr. Whitney, lose temper. He can never tolerate the introduction of such disagreeable topics as these, but is never tired of pouring over maps, and enlarging upon the grandeur of his scheme. So long as his mission was confined to the matter of arousing the attention of our people to the importance of the proposed work, his success was remarkable. The moment he came to the question of construction, his plans failed to receive respectful attention. Congress in fact refused the courtesy of printing extra copies of his bill, for circulation, and turned the cold shoulder upon the whole scheme. As far as a railroad to the Pacific is concerned, the public voice is unanimous in its favor; but in reference to the plan for construction, that of Mr. Whitney's has hardly a defender. We are sorry for his disappointments, and heartily wish he would adapt his scheme to the praetical ideas of the present day, and of which he appears to have not the least appreciation.

Taxing our Railroads.

An attempt, and we hope an ineffectual one, is being made in our Legislature to impose a tax upon the freight carried by the Erie and Ogdensburgh railroads, for the benefit of the Erie canal. The Central line is now compelled to pay canal tolls upon the freight carried over it. There is not so much injustice in this, as we believe this was provided for in the charters of the companies which compose this line; but to compel the Erie and Ogdensburgh to pay canal tolls, is the rankest kind of injustice. If such a thing had been anticipated, neither road would have been built. Both of them have been private enterprises, carried on for the public good; and both have been completed at a great sacrifice of private means. For the State, now that they are completed, and threaten to encroach upon the business of the canal, to interfere with their operations, is a wrong, based upon no other principle than might. We hope that such principles will never obtain in our legislature.

The State cannot afford to adopt any other but the most liberal policy in relation to our railroads. We must remember that these works, both in magnitude and cost, are fast throwing the canal into the shade. Our people will soon have four times as much invested in railroads as they have in canals, and unless our legislature adopts and pursues a most liberal course toward them, they will unite, and make common cause against the work, that stands in their way to success. We shall soon find, that instead of the canal legislating for railroads, these will dictate the management of the canal.—Such an event cannot be long distant. If that work cannot stand upon its own merits, it will go down. The people of this State will never consent that it shall be supported by a tax upon other works, having a similar object. Such a policy would be impolitic and unjust, and cannot be sustained if adopted. Let the State complete the work of enlargement at the earliest moment, and place it in a position to retain its business by the cheapness of carriage, rather than by punishing other works for underbidding the canal. Freight, in the end, will always take the cheapest route, and the interest of the great mass of the community is sure to control our legislature. The State of Ohio, after having expended an enormous sum for unproductive works, authorises parallel lines of railroad whenever asked for, without any restriction whatever. Because she has built unprofitable canals, she does not repeat her mistake, by taxing *profitable* to support *unprofitable* enterprises.

Canada.

Chambly Canal.—Another link in the Northern chain of water communication with the St. Lawrence is being agitated. The Montreal Patriot learns that great exertions are making to complete the improvement in the Chambly canal, the link connecting Lake Champlaim with the River St. Lawrence by the River Sorel. It is added that the active competition between the Ogdensburgh route and the St. Lawrence renders the improvement of the canal of vast importance to Canada. About two miles and a-half of the canal requires to be deepened throughout from 6 to 12 inches—and the locks of the canal must be proportionally elevated.

New York.

A meeting is to be held at Lebanon Springs, Columbia county, on the 10th inst, for the organization of a company to build a railroad from Chatham Four Corners to Hoosic river, to connect with the Western Vermont road, now building from Rutland to the Hoosic river. The projectors have great confidence in their undertaking, as by such a road a direct communication will be had between Vermont and the city of New York.

Maine.

Penobscot and Kennebec Railroad.—The adjourned meeting of the stockholders of the A. and K. railroad holden at Winthrop on Thursday week was characterized by great unanimity of action and harmony of feeling. The proposition submitted by the directors at the previous meeting, to the effect that the A. and K. railroad should unite with the Atlantic and St. Lawrence in leasing the Penobscot and Kennebec road for twenty years provided the Legislature should grant the necessary power, was unanimously adopted. A committee consisting of Messrs. Ware, Morrell, Goodenow and Noyes were appointed to make an arrangement with the Atlantic and St. Lawrence directors in relation to the terms upon which the lease should be taken, and adjust the relative proportion of freight and fares of the respective roads, and report to a special meeting to be called by the directors.

The action of the Atlantic and St. Lawrence and the Kennebec and Andros Coggin railroads, in guaranteeing a dividend upon the stock of a road from Banger to Waterville, will secure the immediate commencement of this link. The most gratifying progress is now making in the whole line from Waterville to Halifax.

New York.

Saratoga and Sackett's Harbor Railroad.—This company is to be organised at Troy on the 10th instant. Could the project be carried out, it would become a formidable rival to the other routes between the lakes and tide water.

Vermont Railroads.

The Boston *Journal* says:—The Vermont, Central and Rutland railroad companies have so far adjusted matters as to establish equal rates for the transportation of passengers and freight to all competing points. An arrangement has also been made to connect the two roads at Burlington, thus giving to the Rutland the advantage of a continuous railroad communication with Rouse's Point.

Indiana.

Indianapolis and Bellefontaine Railroad.—The laying of the iron on the Indianapolis and Bellefontaine railroad has been commenced between Pendleton and Anderson, should the weather prove favorable, it is expected the road will be in running order to the latter place by the 10th of April.

New York.

Syracuse and Binghamton Railroad.—We judge from present favorable indications that this road will shortly be commenced. As yet it is doubtful whether the road will have its terminus at the latter place; this rests, it is stated, with the citizens of Binghamton. If the requisite amount of money is subscribed by them, the road will very likely terminate there. The construction of the road will commence as soon as $500,000 of the stock is taken. It is said that Onondaga and Oswego counties will subscribe $250,000, provided that Broome subscribes $100,000 and Cortland $150,000. There are as present as many as four routes, each warmly advocated by its friends. This certainly shows an appreciation on the part of the inhabitants along the respective routes, of the prospective advantages likely to accrue to them from the construction of the road. A survey has been made to the Tully Summit, and one through Christian Hollow, and the engineers are now running a line through Sherman Hollow. These places are all in Onondaga county. Truxton in Cortland county will subscribe $75,000 if their route is taken. As soon as a sufficient amount of stock is taken, ($500,000) and the route decided upon, the work will be commenced.

New York.

Erie Railroad.—The receipts of the Erie railroad for March prove to be considerably larger than was expected, and show an amount of $8,400 beyond the estimate. The figures are as annexed:

Passengers and mail	$68,800 13
Freight	94,600 86
Total	$163,400 99
March, 1850	130,578 68
Increase, 25 per ct	$32,822 31
The receipts of the first three months of the year are	$433,414
Same time in 1850	345,745
Increase in 1851	$87,669

Electro-Magnetic Locomotive.

The National Intelligencer says that on Thursday last Professor Page made a preliminary trial on the railroad for the purpose of testing the best mode of attaching the battery, which seems to be a difficult point, owing to the jostling and oscillations of the locomotive. It was run out over two miles, and the best speed on a straight track was ten miles an hour. The locomotive weighs four and a half tons, and has five feet drivers with two feet stroke.

Railroad from New Orleans to Texas.

A correspondent of the New Orleans Crescent recommends that a railroad should be constructed from New Orleans to the Sabine, with the view of continuing it, when the population of Texas becomes sufficiently dense, to the San Antonio or Rio Grande. He urges that this road, if constructed to Houston and the Sugar region of the lower Brazos and Colorado, would pay better than any other line leading to or from New Orleans.

Houston is situated nearly due west from New Orleans, and Bexar about a degree south of Houston. The road might be so constructed as to avoid Sabine Lake and Galveston Bay, and after reaching Houston bend a little to the south, so as to touch the upper line of the sugar region of Texas, and extend by Columbus on the Colorado, and Gonzales on the Guadaloupe to Bexar. This great line would then furnish facilities of transportation for all the sugar region of Southern Texas, which is three or four times more extensive than that of Louisiana, and for a cotton growing region capable of furnishing one or two millions bales annually. New Orleans might, by means of this railroad, restore to her markets a trade infinitely more valuable than that she has lost by the northern railroads that have tapped the commerce of the Mississippi, but she might also by this road open a new channel of commerce that would pour into her lap the rich trade of Northern Mexico and California. The commerce of the Father of Rivers would scarcely be more valuable than the commerce that might ultimately be directed to this great avenue. The people of New Orleans have not dreamed of the immense wealth that might flow into the Crescent city from this great garden of the southwest. Stretching from the Sabine to the Rio Grande, lies a planting region which, when its resources are fully developed, will yield a larger annual product of cotton, sugar, tobacco, and the other great staples of the south, than the present product of all the southern States east of the Sabine.

The whole trade of this fertile and extensive region can be directed to New Orleans. If the Crescent city will but extend her iron arms to embrace the riches of this beautiful and fertile region, her golden horns will be filled with plenty.

Ohio.

Columbus, Piqua and Indiana Railroad.—The company constructing this road, have issued a circular in relation to the bonds issued by the trustees of Washington township, in which is included the corporation of Piqua, Miami county, in payment of a subscription of $50,000 to the stock of the above company. These bonds are 7 per cents, and are payable on the 1st of August, 1870, in this city. The interest payable semi-annually. The taxable property of the township ($952,910) is mortgaged to secure the payment of the bonds. A tax sufficient to pay the interest when due, and to create a sinking fund for the redemption of one bond annually, has been assessed by the trustees of the township. This will leave but $30,000 to be redeemed when the bonds become due. The circular refers to the condition and prospects of the township, and particularly to those of the city of Piqua situated within its limits.

The city is situated on the Great Miami river, 75 miles north of Cincinnati, and with the Miami canal running through it. It has a population of some five thousand inhabitants. In it is situated the "Piqua Branch of the State Bank of Ohio," with a capital of $100,000. Some $225,489 is employed in various manufactures of the city. The aggregate amount of value of the different articles manufactured reaches annually over $372,835.—The township is entirely free from debt; and has in her treasury, applicable to the payment of incidental expenses, a large surplus. During the past year there were shipped from the port of Piqua 24,284 barrels of flour, 164,871 bushels of corn, and 3,118,522 feet of lumber, besides a large quantity of other merchandise.

The above road is 86 miles in length. At the date of the circular, February 10, 1851, some 22½ miles of grubbing, grading and masonry was under contract, and it was then expected that the remainder would be let early this spring. The estimated cost of the road, ready for the superstructure, is $4,000 per mile. Of the whole road, 80 miles is nearly a straight line. It will connect with the Indianapolis and Bellefontaine, the Central Ohio, and the Columbus and Cleveland railroads. Running west from Columbus, it passes through the west part of Franklin, and through Madison and Union

counties, to Urbanna, the county seat of Champaign county, situated on the Mad River and Lake Erie railroad, thence to the city of Piqua, on the Miami canal; thence to Greenville, the county seat of Darke county, and thence to the State line, where it intersects a road being constructed by the citizens of Winchester, Indiana.

Memphis and Charleston Railroad.

At last accounts from New Orleans, Governor Jones had obtained subscripttons to the amount of $100,000 in that city, to this great work.

We learn from a friend, that the citizens of Charleston have recently manifested a very lively interest in the success of this enterprise. Several of them, we understand, have transmitted assurances to Governor Jones that "Charleston is ready to subscribe whatever may be lacking after he concludes his labors at New Orleans."

Whether this be true or not, it cannot be doubted that Charleston has far more at stake in the completion of this, than in that of the Nashville and Chatranooga road, to which she subscribed $500,000. Besides the immense tide of travel it will turn through Charleston, it will have a powerful tendency to make that city the importing mart of the South, When the road from Memphis to Charleston is completed, we believe that a large portion of the trade now thrown by our merchants into the lap of the North, will at once be transferred to Charleston. In many places in the south the opinion seems to be gaining ground (and the wish too) that New Orleans is to be the great *exporting* city, while Charleston is to be the great *importing* metropolis of the south.—*Memphis Eagle.*

☞ The celebrated British engineer, Mr. Robt. Stephenson, in a recent visit to Egypt, has surveyed the country between Cairo and Alexandria, with a view to the construction of a railroad between the two places. Another account states that Mr. S. was then on his way to Suez to examine the route for a ship canal between the Mediterranian and the Red Sea. This survey is said to form part of a conjoint survey directed by England, France, and Austria, the former being represented by Mr. Stephenson, France by M. Paulin Talabot, and Austria by M. Negrelli. These latter have completed their labors; and on the completion of Mr. Stephenson's survey, the route will be determined on the conjoint evidence of the three reports.

Pennsylvania.

Railroad Route to Sunbury and Erie.—A report has recently been submitted to the State Senate, by Mr. Walker of Erie, with regard to the connection. Accompanying it is an important communication from G. A. Nicolls, Esq., of Reading, the intelligent Superintendent of the Reading railroad, which is full of information on the subject. He presents several routes which we briefly notice as follows.

1st. From Philadelphia to Schuylkill Haven, via Reading railroad; thence to Coal Castle; thence to Shamokin, and thence to Sunbury, via Danville and Pottsville railroad. Whole distance 150 miles, of which only *thirty-two* miles (from Coal Castle to Shamokin) would require constructing, at a cost of about $1,280,000. The balance of 118 miles is already built and in operation.

2d. Philadelphia to Pottsville, and thence to Sunbury, via Mt. Carbon railroad. Whole distance 146 miles, of which *thirty-three* miles would require to be constructed, at an estimated cost of $1,450,000.

3d. Philadelphia to Mount Carbon, and thence by the Millcreek railroad, via Port Carbon, St. Clair, New Boston and Shamokin to Sunbury—in all 152 miles, 118 of which are built, and 5 on the Millcreek road partially graded, leaving 29 to be constructed at a cost of about $1,200,000.

4th. Philadelphia to Port Clinton, via Reading railroad; thence to Tamaqua, via Little Schuylkill road; thence to junction with Catawissa railroad; thence to Catawissa and thence to Sunbury—in all 167 miles, of which 98 are constructed, and thirty-five of the Catawissa road graded, leaving only 34 to be made, at a probable cost of $1,350,000.

All these routes, says Mr. Nicolls, pass over or through the first and second coal fields of Pennsylvania, containing the richest measures of anthracite coal in the United States; accessible at every point, by any of the routes, and therefore abundantly able to afford a local coal business sufficient to justify their construction. For want of these improvements, thousands of acres of most valuable coal land in the second coal field, are held at a nominal value only, and rise or fall in price, as the prospect of a railroad improves or diminishes.

Mr. Nicolls further states that by the Schuylkill valley lies the shorter route from Philadelphia to Elmira (on the New York and Erie railroad) than from the latter point, by the same railroad, to the city of New York, thus:

Philadelphia to Elmira (via Port Clinton, Cattawissa and Williamsport)	265 miles.
New York to Elmira	283 "
Difference in favor of Philadelphia	18 "

Mr. Nicolls justly remarks that the northern tier of counties in Pennsylvania, is quite equal in fertility of soil, and far superior in mineral wealth, to its southern portion. The former have not increased in wealth or population, as have their more favored southern brethren, aided by large expenditures from the State and the capitalist. Let the northern territory of Pennsylvania, says he, have but a fraction of such outlay expended in constructing such an improvement as this railroad, and with the natural advantages already possessed, she will exhibit results as brilliant as ever witnessed in the history of our progress; and assist more materially in establishing, in 1860, the Keystone State in the proud position she is proved to occupy by the last census—the first of the Atlantic States in the increase of her population!

Wisconsin.

Milwaukee and Mississippi Railroad.—We have the report of the Engineer of this road, B. Kilbourne, Esq., of the operations of this company for the past year. Since its publication, the road has been opened for business to Waukesha, 20¼ miles from Milwaukee. The cost of this section of the road is stated in the report as follows:—grubbing, grading, ballasting and bridging, $68,069 52; timber ties for superstrncture, $14,344 26; rail, $89,280; and laying same, $6,400; other expenses, such as ballasting, engineering, salaries of different officers, etc., $16,565 45; or a total of $194,659 23. The cost of the line from Waukesha to Whitewater, 30 miles more, is estimated at $265,747 23. Of this sum, $89,665 36 is allowed for grubbing, grading, ballasting and bridging, $19,640 for ties for superstructure, $122,720 for iron rails, $15,500 for laying track, and $18,221 87 for engineering, superintendence and incidental expenses. For equipment, the estimate is $95,850 58, of which amount $21,850 58 have been heretofore expended. The cost of depots, shops, water stations, and other fixtures, will make a total of $146,754 35; and including $10,744 84 for right of way, real estate, etc., the whole cost of the road ready for business, from Milwaukee to Whitewater, a distance of 50 miles, will be $307,160 81. There has been expended of this amount, on the first division, the following sums, viz:—east of Waukesha, for construction, $189,474 23; west of Waukesha, for iron, engineering and incidental expenses, $88,300 10; and for fixtures and equipments, $52,804 35. The sum of $3,219 85 has also been expended on the second section.

Owing to the non-fulfillment on the part of the contractors of their contract, the company were compelled to relet such portions of the work as were delayed by the above cause. This, in part, increased the expense of the road from Milwaukee to Waukesha to $15,007 23 beyond the estimates in the report of the board for 1849. The backwardness of stockholders in paying in their instalments, and other unforseen and uncontrollable contingencies and accidents, have helped to bring about this necessary extra expenditure. The work as far as it has progressed, is stated to be of the highest character for excellence, and will favorably compare with any in the Union. Although the company had to encounter, as is usual in the construction of railroads in a thinly settled country, many difficulties and drawbacks, yet, without the aid of the State, which upon the projection of the road was expected, they have finished and put in running order, in the most substantial manner, over 20 miles of line, and have purchased iron and paid for sufficient for 30 miles more, which will carry the road to Whitewater, in the Rock river valley, a sufficient distance to secure to it the carriage of the lead of Wisconsin, most of which is now forwarded by way of New Orleans. As soon as the above point is reached the road will become the route to the lake of the immense products of that fertile valley. Three years more we hope will complete the extension of this road to the Mississippi valley. Such an extension would constitute one of the most important roads in the country. We have no doubt that it will prove a most profitable enterprise upon the completion of its first division.

We omitted at the time to notice the opening celebration of this road, which came off at Waukesha on the 25th ult. with great eclat, at which the Mayor of Milwaukee and other dignitaries made the customary speeches, and other proceedings proper in the premises were had. The event was hailed as an era in the histery of Wisconsin. That State may be proud of the fact that, taking her age into consideration, she has built more miles of railroad than any other State in the Union. There every interest seems to move forward with equal pace.

Exhibit of the Terre Haute and Richmond Railroad.

We copy below a portion of the recent exhibit of this road. It is a work which has been pushed forward with an energy and vigor which have given to its securities a high character in the market, and caused them to be sought for, at an advance of the ordinary rates. It is not too much to say that no work of the kind in the country has been better managed, or in better hands, or has advanced more rapidly in public estimation. Its success is due principally to its able President, who has had the chief management of its affairs.

The Terre Haute and Richmond railroad company was chartered January 26, 1847; the road to extend from the west line of the State of Indiana to Richmond, near the Ohio State-line, a distance of 149 miles. The charter is liberal and perpetual.

By an amendment, passed on the 20th of January, 1851, the road was divided at Indianapolis, making two companies, entirely distinct and independent of each other, the western division from Indianapolis to the west line of the State retaining the original title.

The part of the road now in progress of construction, and which we propose to mortgage, extends from Terre Haute to Indianapolis, a distance of 72 2-10 miles; the grading and masonry is nearly completed, and the superstructure is under contract, and will be ready for the iron the first of May, and we expect to have it in running order by the 1st of December next. Iron of the most approved pattern of T rail, weighing sixty pounds to the yard, has been contracted for, to be delivered at New Orleans in season to be brought up the river during the spring freshets, and we have just been advised that most of it has been shipped to that city.

The requisite locomotives have also been contracted for, and will be finished by the time we are ready to use them.

The right of way, 100 feet in width, has been favorably secured, and the cost will not exceed $5,500.

We think this road is the most important link in the great chain of railways uniting the Atlantic cities with the Mississippi; from Indianapolis various lines eastward, and from Terre Haute various lines branch south and westward, between which points this road forms a link without competition.

It runs through a tier of the most productive counties in the State, in all of which there is scarcely an acre of waste land, and they now contain a population of 79,805 inhabitants, which is scarcely a tithe of the population they can easily sustain. Along the line of the road are extensive quarries of lime stone, and in its immediate vicinity, for several miles along the line, are inexhaustible beds of bituminous coal. During the past winter upwards of 70,000 hogs have been packed in the county of Vigo, mostly in Terre Haute.

The portion of the country which must be tributary to this road, only awaits development to show the immense extent of its surplus productions, and insure to the road a vast local business.

To make some calculations of the through business and travel which it will take, examine a map of the country, and view its connection at Indianapolis with every leading road east, between the lakes and the Ohio river. The three main lines to New York, Philadelphia, and Baltimore, are all located, and not to exceed one hundred miles, on either line, that is not under contract or completed, and all will probably be finished in less than two years from the present time.

The Peru road has just been completed twenty miles; the Bellefontaine has twenty-eight miles finished and in successful operation, and twenty-four miles more will be completed the present year; the central line to Richmond and thence to Dayton, Ohio, is mostly under contract for grading, and will be pushed forward to early completion.—A line will branch off from near Richmond to Eaton, Hamilton and Cincinnati, forming a very favorable line to that city; another line is also in progress of construction from Cincinnati by Lawrenceburgh, Greensburgh, and Shelbyville to Indianapolis; then, there is the Madison and Indianapolis road, with its immense business, and the Jeffersonville road, soon to intersect it at Columbus; all concentrating their westward-bound freight and travel at Indianapolis, and pouring the same inevitably upon this line of road.

Illinois has granted a liberal charter for a road from Alton to the State-line near Terre Haute; the road has been located, and a large amount of stock subscribed along the line, and its construction will doubtless be commenced the coming sprihg, and be completed within three years from the present time, and we are in hopes to soon obtain a charter direct to St. Louis. There is also a road in progress of construction from Evansville to Terre Haute, and twenty-eight miles will be completed the present year.

The road to Alton will doubtless branch to Springfield, thence to Quincey, and Hannibal, Missouri, connecting at that point with the road to St. Joseph.

It will also intersect the great central road of Illinois from Cairo to Chicago, at Shelbyville, thereby forming the shortest and most direct route of southern travel through Terre Haute and Indianapolis to the east.

The estimated cost of the road from Indianapolis to Terre Haute, ready for the iron—as made by Captain Morris, Chief Engineer, on the 6th of January last, including the right of way, depots and machine shops, water stations, grading, bridging, superstructure, and one-third the Union tract and one-third the Union lot for a joint passenger depot at Indianapolis and incidental expenses—amount to $498,451 52·100.

To meet which we have a subscription to the capital stock of the company, including the amount paid and payable to contractors, of $450,250, and have made a loan of $50,000, payable on the 1st of January, 1855, making in all $500,250, which will be amply sufficient to prepare the road for the iron.

To Contractors.

ENGINEER'S OFFICE CENTRAL OHIO R. R.,
Zanesville, March 20, 1851.

SEALED PROPOSALS for the Masonry of a Railroad Bridge across the Muskingum River at Zanesville, will be received at this office until the 15th of May next.

Also for the Iron or Wooden Superstructure of said Bridge, and for draw bridge across the Canal.

Plans and specifications furnished on the 1st of May next. Bidders may furnish their own plans and specifications, if filed at this office prior to that day.

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Cozzens, W, H.,
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Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

Floyd-Jones, Charles,
Alton and Sangamon Railroad, Alton, Illinois.

Gay, Edward F.,
Columbia and Philadelphia Railroad, Philadelphia Pa.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Grant, James H.,
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Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Steele, J. Dutton,
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Troy, N.Y.
ERASTUS CORNING, Albany;
WARREN DELANO, Jr., N.Y
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md
November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phœnix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehannah river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia.
March 15, 1849.

LAP—WELDED
WROUGHT IRON TUBES
FOR
TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.
THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron. THOMAS B. SANDS & CO.,
73 New street,
February 3, 1849. New York.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for sale by GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES. — The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head From the excellence of the material always used in their manufacture, and their very general use for rail roads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.
JOHN F. WINSLOW, *Agent.*
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, o Erastus Corning & Co Albany; Merritt, & Co., New York; E. Pratt & Brother, Baltimore, Md.

AMERICAN PIG IRON.

"POUGHKEEPSIE" brand, Dutchess Co., N.Y.
"GLENDON" brand, Lehigh county, Pa.

Orders for the above two well known brands will be received, and promptly executed, by
J. & L. TUCKERMAN,
69 West St., New York.

Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.

These Axles enjoy the highest repulation for excellence, *and are all warranted.*

Bowling Iron. Stamped B.O.

Railway Tire Bars | Rivet Iron
Locomotive and other Axles | Locomotive Frame do Bars,
Boiler Plates
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL
AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent.,
218 Pearl st., New York.

Smith & Tyson,,
IRON COMMISSION MERCHANTS,
BALTIMORE.

REFINED Juniata Charcoal Billet Iron for Wire.
Do. for Bridging, of great strength.
Flat Rock, Boiler and Flue Iron, rolled to pattern.
Elba, Wheel Iron of great strength and superior chilling properties. Elba Forge Iron, American Shot Iron, Cut Nails, Spikes and Brads, Nail and Spike rods, Railroad Spikes of superior quality, Wrought Chair plates of any pattern, punched or plain.

WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtus & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntzs Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Car Wheel Iron.

THE celebrated cold blast "Conowingo" Pig Iron, for Railroad Wheels, Chilled Rolls, etc., for sale by
E. PRATT & BROTHER,
Baltimore, Md.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on he oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,
AND
ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Bowling Tire Bars.

40 Best Flange Bars 5½x2 inches, 11 feet long.
40 " 5½x2 " 7 feet 8 in. long.
40 " Flat " 6x2 " 11 feet long.
40 " 6x2 " 7 feet 8 in. long.
Now in store and for sale by
RAYMOND & FULLERTON,
45 Cliff street.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
3m9 62 Buchanan's Wharf, Baltimore.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Aug. 26, 1850.

N.B.—B., J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from ½ to 5 inches diameter. Flats, from ½ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Car Wheel Iron.

100 Tons "Columbia" No. 2 Cold Blast Charcoal Iron.
300 Tons "Salisbury" No. 1, do. do.
For sale by CHARLES T. GILBERT,
No. 80 Broad st.
New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton. DUDLEY B. FULLER & CO.
139 Greenwich st. corner of Cedar.

S. S. Keyser & Co.,
IRON WAREHOUSE,
Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electerised Steel, etc., etc.

Tubes.

The undersigned are in direct communication with the *Birmingham Patent Lap Welded Iron Tube Company*, for the sale of their very excellent and superior Boiler and Gas Tubes in large or small quantities.—These Tubes are sold very extensively in England and on the continent of Europe are sold exclusively by
WM. BIRD & CO.,
Iron and Tinplate Merchants,
44 Wall st., New York
5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

Railroad Spikes, Boiler Rivets, etc.

THE Subscribers, Agents for the sale of James S. Spencer's, Jr., Railroad and Boat Spikes, Boiler Rivets, and Wrought Iron Chairs for Railroads, made at his Works near this city, will execute all orders with promptness, despatch, and of the best quality.

ALSO IMPORTERS of English refined and Merchant bar Iron; Extra refined Car and Locomotive Axles (from 3½ to 6½ inches in diameter); B. O. Locomotive Tire (welded by Baldwin). Also, supply Boiler and Flue Iron cut to pattern or otherwise.—Spring, Shear, and Cast Steel, etc., etc., etc.

T. & E. GEORGE.
Philadelphia, November 14, 1850.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the *very best* quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.
February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.
And at 5 Martin's Lane, City, London,
and 140 Buchanan st. Glasgow.
July 27th, 1850.

Railroad Iron.

THE "Montour Iron Company" is prepared to execute orders for Rails of the usual patterns and weights, and of any required length not exceeding 30 feet per rail. Apply at the office of the Company,
No. 73 South 4th st., Philadelphia,
Or to the Agents,
CHOUTEAU, MERLE & SANFORD,
NO. 51 New st., New York.
September, 1850.

Railway Iron.

THE Subscribers will contract to deliver, in the course of the ensuing Spring and Summer, the best English Rails, made by a particular specification, and of any pattern required.

DAVIS, BROOKS & CO.,
68 Broad st.

On hand for sale, English rails of 58 lbs. to the yard, made by particular specifications.

January 10, 1851. 2m

Railroad Iron for Sale.

THE Mansfield and Sandusky City Railroad Co. have on hand from twelve to fifteen hundred tons of American Flat Bar Railroad Iron, weighing 38 lbs. to the lineal yard, which they offer for sale at reasonable rates.

The iron has been in use about four years, and is sound and in good condition. It is 2½ by ½.

It will be ready for delivery at short intervals between the opening of navigation in the spring and the 1st September next.

For further particulars inquire at the office of the company at Sandusky City, Ohio.

C. G. FORBES, President.

December 24, 1850.

UNION WORKS,

North street, opposite the Railroad Depot,
BALTIMORE.

Poole & Hunt,

Manufacturers of Steam Engines and Mill Gearing, Machinists' Tools, and all kinds of heavy and light Machinery.

Also put up *Arrangements of Wrought Iron Pipes* for heating buildings and conveying steam or water.

Castings of every kind furnished at short notice.

Every exertion will be made to insure the satisfaction of customers.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,
No. 24 Commercial St. Boston.

August, 16, 1849. 6m33

Railroad Paint.

FOR depot buildings, bridges, burthen cars, wheels and axles, pipes, steam joints, fences, and every description of work requiring protection from the action of the elements. Price per barrel of 300 pounds, nine dollars.

Orders addressed to J. M. HALL, 36 South street, New York, will receive prompt attention.

March 18, 1851. 3m*

To Engineers and Ship Builders.

THE Advertiser is desirous of a situation in a respectable concern, he has acquired a practical knowledge of his business in the establishment of R. Napier, Esq., Glasgow, has since for several years had the management of the works of an extensive Steam Packet Co., for whom he designed and built some Iron Screw Ships, whose capabilities and performances give the highest satisfaction. While acquainted with all the most approved modes of construction of marine engines, he is prepared to submit original designs. In modelling and draughting he has had much and successful experience. Can produce the highest testimonials as to character and abilities from the first engineer on the Clyde.

Address ENGINEER, box 2315 lower postoffice.

Lawrence Scientific School, HARVARD UNIVERSITY,

CAMBRIDGE MASSACHUSETTS.

SPECIAL Students attend daily from 9 o'clock A. M. till 5 o'clock P. M., in the Laboratories, and under the direction, of the following Professors:

Louis Agassiz, L.L.D., Professor of Geology and Zoology. Jeffreys Wyman, M.D., Professor of Comparative Anatomy and Physiology. Henry L. Eustis, A.M., Professor of Engineering. Eben Norton Horsford, Professor of Chemistry.

Instruction is also given by Prof. Peirce in Mathematics, Prof. Lovering in Physics, and the Messrs. Bond at the Astronomical Observatory.

All lectures delivered to under graduates of the College are free to members of the Scientific School.

For further information apply to

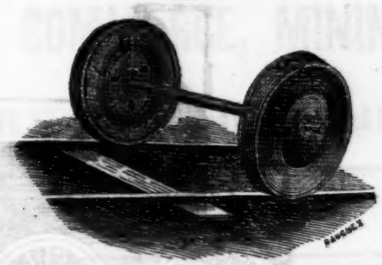
E. N. HORSFORD, Dean of the Faculty.

Boston Locomotive Works,

—Late Hinkley & Drury—
No. 380 Harrison Avenue,
BOSTON.

Locomotive and Stationary Steam Engines; Boilers; Iron, Brass, Copper and Composition Castings; Coppersmith's Work, and all kinds of Railroad Machinery furnished at short notice.

ALSO



Van Kuran's Improved Rail-Road Wheel,

Patented May 1, 1849. Manufactured under the personal superintendence of the Patentee, as above.

Orders for any quantity of wheels executed with dispatch, and wheels and axles fitted in the very best manner and at the lowest rates. Address

DANIEL F. CHILD, Treasurer, Boston.

Providence Tool Co.,

MANUFACTURERS OF

Plane Irons, Tooth Irons, Soft Moulding and Rabbet Irons, Cornice Irons, Plow Bitts, and Planing Machine Knives:

NUTS, WASHERS AND BOLTS.

—ALSO—

PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work.

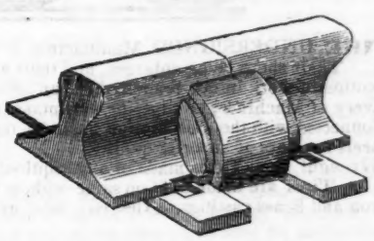
WM. FIELD, Agent. RUFUS WATERMAN, Treas.

PROVIDENCE, R. I.

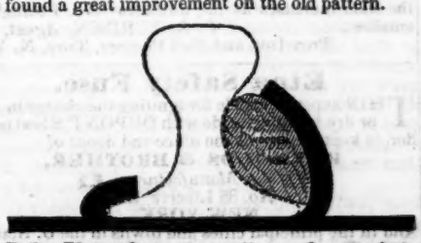
Railroad Iron,

SPIKES, AND

WROUGHT IRON CHAIRS.



THE Undersigned, Agent for Manufacturers, is authorised to contract for Welsh *Railroad Iron* of the best quality, and deliverable at any port on favorable terms, also *Spikes and Wrought Iron Chairs*, made from the best iron, and of any pattern and weight. The new Wrought Iron Chair, with the introduction of a "Key," as per the annexed plan, will be found a great improvement on the old pattern.



Boiler Plates of superior quality, perfect regularity in the squaring and thickness, and made with great care.

Samples can be seen at the office, No. 20 Beaver st.

CHARLES ILLIUS.

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the INDIA RUBBER CAR SPRING, on account of priority of invention of said Spring.

F. M. RAY.

New York, Oct. 23, 1850.

Iron Trade of Pennsylvania.

DOCUMENTS and Statistics relating to the Manufacture of Iron in the State of Pennsylvania—giving a history of the manufacture from its commencement to this date, illustrated by diagrams. Also tables giving the address and capacity of every establishment in the State. Prepared by direction of the late convention of the trade held in Philadelphia. For sale by

LINDSAY & BLACKISTON, Philadelphia.
FIELDING LUCUS, Jr., Baltimore.
HENRY G. NICHOLS, 79 Water st., N. Y.
or at this office—price $1 00.

It will be sent by mail to any order enclosing the money, and post paid.

Ulster Iron.

THE ULSTER IRON WORKS, Saugerties, N. Y., continue in full operation. Orders for *round, square, flat, band, hoop and scroll iron*, will be received and promptly executed by

J. & L. TUCKERMAN,
69 West St., New York.

Patent Machine Picket Fence

SIX DIFFERENT STYLES of this fence are now made by patent machinery; and is by far the most economical fence for *Railroads, Farms, Yards*, etc., ever yet offered to the public, costing only from 4 to 30 cents per foot, according to pattern; and is so put up as to be shipped at a trifling expense. Full particulars will be furnished, by addressing the subscriber, to whom all orders should be sent.

N. STRATTON, Troy, N.Y.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS J. LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

American Railroad Iron.

1000 Tons, weighing 50 lbs, per yard, manufactured by Reeves, Abbott & Co., at the Safe Harbor Iron Works, and now lying in yard at Brooklyn, for sale by

CHOUTEAU, MERLE & SANFORD,
No. 51 New street.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplie by addressing

J. W. FLACK,
March 6. 1850. Trov. N. Y.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

India-rubber for Railroad Cos.

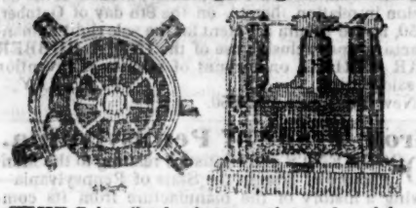
RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent—Hose* from 1 to 12" diameter. Suction Hose. *Steam Packing* from 1-16 to 2 in. thick. *Rubber and Gutta Percha Bands.* These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849. No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phœnixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery *for making Spikes*, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNdersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

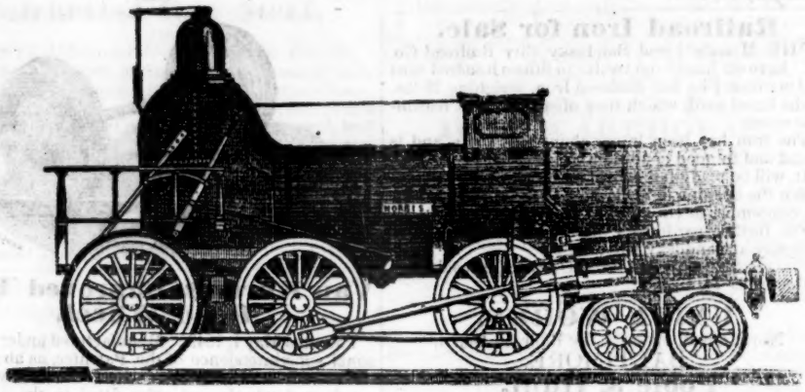
He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others. J. L. BROWN.

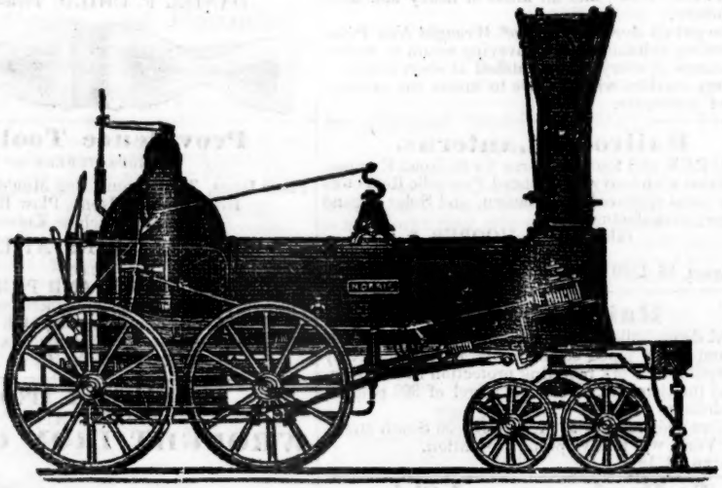
☞ Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,





THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size.

Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tires are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general asssortment of Horse Shoes, made from Refined American Iron.

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